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RELATIONS BETWEEN THE SEXES IN SONG SPARROWS

BY MARGARET MORSE NICE

During the past four years I have concentrated on the study of the Song Sparrows (*Melospiza melodia beata*) that live in large numbers near our home, in 1929 spending all my time on two pairs, but after that taking an interest in more and more birds. I am keeping track of the major events in the population on the forty acres of Central and North Interpont (see Nice, 1931a and 1931b), but at least fourteen banded birds and probably quite a number more have scattered out to all points of the compass, two having settled a whole mile from our house. Up to the present I have banded (with colored as well as aluminum bands) 154 breeding males and 125 breeding females, not to mention about 250 nestlings and about 150 transients and winter residents.

The Relations Between the Pair

About half the breeding males and one-tenth to one-fourth of the females are permanent residents; the rest of the birds leave in October and return from late February to the first week in April. The male is strongly territorial from February to July, but although (if a resident) he stays on or near his territory during the rest of the year, he does not defend it except in the case of a young male settling on it with a view to permanent residence during the molt of the rightful owner. He does not drive his mate from it at the end of the breeding season, as Burkitt (1925) found with the Redbreast (*Erithacus rubecula*); both birds remain but gradually become indifferent to each other.

The male is the guardian of the territory and of his mate and young; he is zealous in feeding the latter, often taking sole charge of the little birds soon after they have left the nest, while his mate busies herself with preparations for the next brood. The female builds the nest, takes entire charge of incubation, broods the young and also feeds them. She is attached to the home territory and helps defend it,

but she never holds territory by herself alone, as do female Redbreasts (Burkitt) and some Shrikes (*Lanius ludovicianus*) according to Miller (1931). The tie with the young is broken when they are about a month old. The tie between the pair is broken at the end of the nesting season, for even when a resident male and female are mated two years in succession and both have stayed in the vicinity of the territory throughout the fall and winter, they do not associate together at these seasons, taking no interest in each other except during the breeding season. This is in contrast to the behavior of some birds —Carolina Chickadees (*Penthestes carolinensis*) and Carolina Wrens (*Thryothorus ludovicianus*) (see Gillespie, 1930) for instance—where a banded pair often remain together throughout the year.

Song Sparrows cannot tell the sex of one of their own kind except by its behavior and notes, unless the birds are personally acquainted with each other. This has been evident in experiences with a new method I have developed for capturing my birds; I find that it is often possible to catch a male by using a male neighbor as decoy in the trap, or a female by means of a female neighbor. But a male or female placed in a territory that is not contiguous to its own, elicits very little interest from the male owner of the territory and even less from the female.

The female in the early breeding season announces her identity by her notes—either a high-pitched, nasal *eeeeeee* or a kind of chatter; she also indulges in various growling, grumbling expressions. The male does not strut, nor puff, nor sing a special love song for the benefit of his new mate; indeed, the suppression of his almost constant singing indicates the arrival of a female. His one method of courting is to fly down suddenly, hit his mate and fly away with a triumphal song! This "pouncing" is evidently analogous to the "sexual flight" described by Howard (1929) in the Yellow Bunting (*Emberiza citrinella*) and Reed Bunting (*Emberiza schoeniclus*); but the Song Sparrow female does not try to escape; she stands her ground and says either *eeeeee* or gives a gruff note of dismissal, *jee*. Mated males "pounce" on neighboring females when the mates of the latter are at the other ends of their territories; the females always repulse them and their husbands usually come dashing to the rescue, whereupon battles ensue. Pouncing takes place from the first arrival of the female to the beginning of egg laying; a new cycle is initiated by the reappearance of pouncing. Copulation comes later—usually shortly before the beginning of nest building—and lasts until incubation begins; the male never gives any note after the act, but the female often says *eeeee*.

The male is very solicitous over his mate when she has first joined him, giving the fear note *tit-tit-tit* at the approach of a person; he watches after her, usually mounting bushes and trees, while he is careful to keep between her and another male. She follows him at times, again he follows her. During the first few days they usually do not keep close together, but after that they may almost always be found in company.

Schjelderup-Ebbe (1924) makes much of "despotism" between birds, stating that the normal situation is that of a benevolent despotism of the male. Between Song Sparrow mates each bird is the despot in certain relations, the male notably so in his pouncing and in driving his mate home if she happens to be frightened from the territory by a person, but the female rules in the little affairs of every day life. He never drives nor pecks her, but she often opens her bill at him, gives him small pecks or drives him to a moderate extent. She says *jee* to him, but he never says it to her.

The Situation During One Season

My Song Sparrows usually remain with the same mates throughout one nesting season. There are two reasons why these birds are generally faithful in contrast to the House Wren (*Troglodytes aedon*) (Baldwin, 1921) that usually change mates, and the Bluebird (*Sialia sialis*) and Brown Thrasher (*Toxostoma rufum*) that often do so (Nice, 1930a). First, they are so markedly sessile on their territories that they seldom stray from them; second, their nesting cycles usually overlap, so that there is no opportunity for the parents to become separated.

There is a high mortality of both males and females during the nesting season (Nice, 1931a, 1932); the loss of females is always greater than that of the males, but the replacement in this sex is also greater. The disappearance of the females has averaged thirty per cent during three seasons, while replacements have amounted to slightly over one-third as many—i. e., of 115 females[1] 41 disappeared during the breeding season, while 15 new birds came after the nesting season was well under way. Of 96 males 22 disappeared and 6 new ones came in during this same period.

Only once has a new male appeared and joined a widow that was trying to raise a young family alone (Nice, 1932). Replacement in

[1]These statistics are based on the Song Sparrows on Central Interpont in 1930 throughout the nesting season, and in 1931 until June 6; in 1932 the birds on North Interpont were also included and the record kept until June 14. A few of these birds were not banded.

the case of females is seldom prompt; almost always a male has to sing for several weeks—one as long as six weeks—before being joined by a new mate, while a number remain widowers till the end of the season.

Is there a reserve supply of unmated birds? There is a slight preponderance of males in the population, but the unmated birds, almost without exception, are settled on territories. Sometimes a male tries in rather a half-hearted way to establish a territory and later disappears. One such bird returned the following year and procured his home and mate with little trouble. When there is a surplus of birds as was the case in 1932, a few of the young resident males appeared to be crowded out by the adult summer residents. Whether such a bird finds a territory elsewhere, or wanders about during this year I do not know. I believe he would settle down, if it were at all possible. The few males that have come into Interpont during the nesting season, might well have been dispossessed of their territories by human activities.

I do not believe there is any floating population of unmated birds among the Song Sparrows. Both males and females that come into Interpont during the nesting season seem to me probably birds that have been for one reason or another driven out from their original homes.

Desertions. In only one case has a male deserted a female and here two abnormal features were involved. The pair—27M[2] and K29[2]—were driven from their territory south of Central Interpont by the ploughing of their land on April 12, 1930; after some difficulties they settled some 300 yards to the north. On May 20 I tried to capture the birds by placing a trap over their nest containing two six-day-old Cowbirds (*Molothrus ater ater*); K29 entered readily, but 27M was so upset that he deserted. I believe he settled about 200 yards to the west, where I caught a new male I called 29M. In the meantime K29 continued to care for her step-children and on June 4 her neighbor 26M was seen assisting her in her onerous task and afterwards they raised a brood together.

Howard (1929) never found a female that deserted her mate after once joining him. With my Song Sparrows faithfulness is the rule, yet I have observed a number of cases of desertion with banded birds,

[2]The birds are given field numbers in the order in which I become acquainted with them; the males 1M, 2M, etc., the females K1, K2, etc., each number belonging exclusively to one bird and not referring in any way to its mate. I thought at first (Nice, 1930b) that it would be sufficient to name a female according to her mates, but this has proved impracticable.

especially in the "bethrothal period", or Howard's "second phase"—the period (which may last almost two months) between the arrival of the female and the start of copulation. Two desertions have taken place just at the beginning of nesting activities—Howard's "third phase"—and two in between broods.

In two cases desertions occurred when the pairs were driven from their homes. This spring Interpont has been taken over for gardens for the unemployed, and the consequent "cleaning up" of the weeds and elders that started March 1, drove two pairs and two unmated males from North Interpont. Two of the males have moved so far away that I have not been able to find them; one settled just across the river; and another came down into Central Interpont some 300 yards south of his former territory. The mate of one of the first two birds joined a male in Central Interpont about 150 yards from her former home, while the mate of the fourth male disappeared entirely.

Four birds (with no reason that I could see) have changed their minds as to which mate they wished to stay with. One resident, K42, joined 9M on February 22, but on March 2 was with 66M; from March 5 to 17 she stayed with 11M, but rejoined 9M by March 22 and remained and nested; all these males were fairly near together. K58 has moved from one mate to another two years in succession. In 1932 she returned to her former territory March 3; her last year's mate was dead, but she stayed with his young successor until March 19, when she took up her abode with 9M about 100 yards southeast. This spring she joined 4M who has settled on 9M's land (the latter having died) on March 13, but three days later had moved 100 yards west and became 143M's mate. Two other females deserted mates for no known reason, one having been with her first choice from February 15 till March 25, but the other making the change after only about a week's stay with the first bird. In this last instance an interval of bleak weather had disorganized the pairs, but usually in such cases the birds return to their proper mates.

By February 15 K83 had joined a juvenile resident male, but when on February 26 he was driven out by the summer resident owner of the territory, his mate stayed with the victor. This is my only instance where a mated male has been driven out by a later comer; typically territory affairs are pretty well settled before mating begins.

In all these cases the deserted males were normal individuals that later raised families with other mates. But in two cases there was an abnormality in the male. 95M sustained a broken leg that never

healed properly, so that it hung useless; he sang less than most of the normal males, nevertheless by March 30 he had a mate, K106. On April 22, when the other Song Sparrows were starting to build, I found a curious situation in the family; 95M was singing busily, but K106 was sitting high in a tree. 95M came near to feed, but she failed to join him. Ordinarily a female keeps low in the bushes and the pair are almost constantly together. I never saw this female again. 95M sang to some extent, but soon became inconspicuous; he was seen in December, but evidently came to his end before spring.

The story of 68M is rather strange. In 1931 his mate, K60, laid five eggs; one of these disappeared; two were infertile; one hatched into a normal bird, but the other nestling was deformed. At the age of nine days when it died, its right side showed development proper for a six-day-old bird, but its left only four days. Its right femur was 27 mm in length, its left 16 mm; its right toes 8 and 11 mm, its left 5 and 6 mm; the sheaths of its right primaries 21 mm, its left 4 mm.

In 1932 68M returned February 27 and got a mate, K100, March 26. K60 came two days later and joined the male next to the south; her first set contained four eggs, all of which hatched and were raised successfully. So it would appear as if the defect were in 68M. On April 28 or 29 K100 deserted 68M and joined 66M 100 yards to the west, 66M having lost his first mate about April 26; these two birds nested and achieved the unexampled feat of raising two Cowbirds and two of their own young. It looks as if 68M, although normal in size, weight, and singing behavior were somehow lacking in his sexual behavior. He has returned for the third season and has for his mate a bird I banded in the nest in 1932.

In two cases mothers have followed their young into the territories of widowers, and instead of returning to their mates, have stayed and nested.

The Situation from Year to Year

In only five instances has there been remating a second year among my banded Song Sparrows. In two of these cases the females were residents; they stayed permanently in the same regions, and their former mates having survived, it is natural that they should remate the second year.

Other banders with only a few pairs of Song Sparrows in their vicinity often report the presence of the same pair two years in succession (Baasch, 1927, Burtch, 1925, Haldeman, 1931, Hamill, 1926, Higgins, 1926). I believe it is of comparatively rare occurrence on

Interpont because of the large number of birds and the many chances a male has to get a mate before his former mate arrives, the presence of the resident females being a complicating factor. I do not have any case of a female joining a new mate when the old was available; either the former husband was dead or was already mated, or, in one case, returned later than she did.

Female Song Sparrows do not fight each other over mates. They do exhibit a defensive attitude towards their neighbors of like sex, dogging each other's footsteps in a hunched up or puffed out attitude, in the meantime busily eating. In 1929 the two pairs I was studying often met at the feeding station I maintained on the boundary line, whereupon the males would threaten each other and the females do the same, once the latter staging a real battle.

Bigamy

Twice I have found male Song Sparrows with two mates at the same time. The habit of the male of pouncing on neighboring females opens the way for the acquisition of an extra mate, although under ordinary circumstances a female repulses any male but her mate.

It was most astonishing to me to discover on May 1, 1931, that 48M had two mates. The two nests were about fifty yards apart in the same ditch; the young in the nest with his original mate, K51, left May 12; those in the other nest hatched May 13 and 14. It was not until the latter date that I realized that 48M was doing double duty, feeding the young out of the nest and calling K76 off of her nest, besides driving other birds from its vicinity. During the hour and a half that I watched, 48M did not feed the small young in the west nest. The two females did not meet while I was there. Unfortunately K76 was killed on her nest that night by a dog and her young were dead beneath her.

The second case I had much more chance to observe. On February 26, 1932, I first noticed a sooty-looking (and hence a resident) male, 113M, in the ditch next to 12M's land. He was a puzzle to me, for he almost never sang and his neighbors did not seem to resent his presence. He remained and finally—April 18—got a mate, K131, whom I had banded as a nestling the previous summer.

About April 24 my fine old male 12M disappeared and his mate, K89, instead of joining one of the mateless males in the vicinity, simply stayed on as the second wife of 113M. She must have had a nest started with 12M and thus felt anchored to her territory; I never found this nest which was evidently destroyed, for she built

another in which she laid May 11 to 15. K131 laid her set May 8 to 11. Each female stayed in her respective ditch for the most part; once I saw them meet on the dike, but neither showed hostility. 113M shared his time between them, although appearing to prefer K89 and to be more anxious when her nest was visited than the other. He called both of them off the nest, and helped feed both broods, although not zealously. Both nests held Cowbird eggs. Some enemy must have carried off all the Song Sparrow young from K89's nest, so only a Cowbird was raised. K131 had three young of her own (one egg being sterile); a severe drought was causing losses in most of the Song Sparrow nests at this time, and K131 had but inefficient help from her preoccupied husband; she succeeded in raising only one of her own young besides the Cowbird.

It was a curious situation that such a self-effacing male should have two mates, while eight or ten of the other males on Interpont were mateless, including his next-door neighbor. In 1933 113M got a mate in February; when his two former mates returned in March, neither insisted on becoming a supernumerary mate, but joined other males in the vicinity.

Some Concluding Observations

The male chooses the territory, although it seems to be more or less haphazard and without much intelligence. At any rate those territories with water or with large trees, those less frequented by people, and those that appeal aesthetically to us, are not taken any more readily than those covered merely with bushes or even with weeds and rubbish. The male appears to exercise no choice as to his mate, but is happy to welcome the first comer that greets him with the appropriate notes.

The female returns to her former nesting site if possible; if that is preoccupied, she usually settles as near as she can. She appears to exercise no choice as to desirability of territory, as to beauty or variety of song in the male, nor even in the matter of physical perfection. 11M had half of one of his legs shot off, but both years he got mates earlier than some of his neighbors. (I know the history of only one of his nestings; in this three out of five eggs were infertile). A female with only one foot was at no disadvantage in getting a mate; she was able to build an elaborate nest and raise a brood. When we also remember 95M, we are forced to conclude that Song Sparrows are not very observant when choosing mates.

We are accustomed to think that birds that hold territory must do so vigorously or fail ignominiously to reproduce themselves. Nichol-

son says (1929:27), "The proper quota of inhabitants will be made up from the strongest and most self-assertive birds". But, although most of my Song Sparrows are zealous in singing and in territory defense, a few are not, yet they appear to prosper equally well. This has been true of 57M, although inconspicuousness is his rule of life; and I have seldom heard him sing. He was hatched June 6, 1930, and has lived on North Interpont ever since. Each year he has had a mate, yet he is so retiring that it is usually impossible to find him, although I repeatedly search his territory. Thus this bird that never properly proclaims territory has survived for nearly three years and raised young at least once and probably several times. 113M is also an example of an unassertive bird that was doubly successful.

I hope that this paper will not give a false impression of the marital relations of my Song Sparrows; although considerable space has been devoted to desertions and to two cases where males had two mates at one time, yet the majority of my birds are models of devotion to home, mate, and family.

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Columbus, Ohio.

IN THE HAUNTS OF CAIRN'S WARBLER—A RETROSPECT AND A COMPARISON*

BY G. EIFRIG

The locality under discussion is Accident, Garrett County, Maryland, and its vicinity. Garrett is the westernmost and the most elevated county in Maryland. The mountains cross the county from southwest to northeast. They are not so conspicuous for their height, but rather for their long, unbroken contour or crest, which at the same time is broad. Even before the lumberman's ax desecrated this garden spot, there were numerous open, grassy places, called glades, on the forest-covered crests, which then invited and now have partly given way to farms. The mountains to the east of Accident are Negro, Meadow, Great Backbone Mountains, the last continued northwardly by the Big Savage, on the eastern slope of which Frostburg is situated.

The region is much dissected by ravines eroded by the rivers and creeks. Some of the drainage goes into the Youghiogheny, a tributary of the Monongahela, which, in turn, empties into the Ohio, and eventually into the Gulf of Mexico, the remainder into the Potomac, and with it into the Atlantic. These creekbeds, usually lined with fine old hemlocks and dense thickets of rhododendron are the typical home of Cairn's Warbler, also on the tops of the mountains wherever hemlocks and rhododendrons are. This is the combination: Cairn's Warbler is found wherever rhododendron grows; this as a rule grows only where hemlock is found, and that is always along or near water.

Although the elevations above sea-level are not so great, the effect on flora and fauna is most remarkable. The geological survey plug in front of my hosts' house in the village of Accident shows 2395 feet, while that on George's Hill nearby gives 3004 feet. Thus the fauna and flora is a mixture of Carolinian, Transition, and Canadian. That is what makes the region so fascinating to the naturalist. Almost side by side with such northerly species of trees as hemlock and white spruce are found the tulip and cucumber trees, members of the magnolia family; also sassafras, flowering dogwood, and witch hazel; and in the lowest part of the course of Big Bear Creek, near Friendsville, on my last visit this past summer (1928) I found for the first time Hercules club (*Aralia spinosa*); also, on the Great Backbone across

*This paper was written five years ago. Last year another change for the worse took place, the death of my friend, companion, and guide, Mr. Fred Burkhard. He was a keen observer, and a lover of nature. G. E.

the boundary in West Virginia, the pipe vine, *Aristolochia macrophylla*, the northern *Oxalis acetosella* and the southerly *stricta*, *Clintonia borealis* and *umbellata*. Many species of oak and maple are here, also several lady-slippers, habenaria, cranberry, and sundew.

This mixture of northern and southern species is just as apparent, or more so, in the fauna, especially the avifauna. The same stream may harbor the Louisiana and the Northern Water-Thrushes as breeding birds, and the Bewick's and Winter Wrens, the Golden-winged and the Canada Warblers. I have never seen the Canada Warbler anywhere in Canada as numerous as in certain spots in these mountains. The same is almost, if not quite, true of the Magnolia and Blackburnian Warblers. The following shows the striking effects of such a relatively small altitude in this latitude. There may be much snow, with a long time of sleigh-riding, and much sub-zero weather at Accident and even Frostburg, the latter only twelve miles from Cumberland, while at the last-named place there is no snow all winter, or not much of it, and mild weather throughout. Here the principal breeding warblers are the Prairie, Hooded, and Worm-eating, none of which are ever seen at Accident. Cumberland has an elevation of 750 feet.

I have been going to Accident off and on since 1901. Not much change is observable. That is what makes it so attractive and restful to me. No shrieking, puffing locomotive here, for there is no railway. The narrow gauge that ran from Friendsville along Big Bear Creek up to Meadow Mountain has long since fallen into decay. Owing to inaccessibility or to the love of some owners for their fine old trees—ancestral heirlooms in most cases—lumber companies did not get all the fine old hemlocks and white spruce, no doubt much to their disgust. A fine new, hard, highway has been built through the valley from Oakland to the old Cumberland Pike at Keyser's Ridge. The only changes I noticed this past summer (1928) were these: electric light had been introduced, the Starlings had established themselves, and the chestnut blight had killed most of the chestnut trees on the rocky mountain tops and sides. But even these wounds have been beneficently healed over by Mother Nature.

Now as to the birds of the region. The last visit was the first one since 1920. One will, under such conditions, naturally make comparisons. The results will, in this case, not be simply imagination, as I have made it a habit for many years to record the number of birds of each species seen during a walk.

Waterbirds are few and far between here. This is to be expected, because beside the usually narrow runs and creeks, flowing in steep-sided little valleys or even gullies, there are no water-bodies, with the exception of two small artificial ponds. Here is where Killdeer and Spotted Sandpipers breed, a Green Heron on Big Bear Creek. This condition is being changed, however, owing to the construction of a dam on Deep Creek for power purposes, which has resulted in a large lake, about twelve miles from Accident, where gulls and ducks have already been seen.

Of gallinaceous birds there are only the Ruffed Grouse and the Bob-white; the former has decreased, the latter increased in numbers in the last eight years. The Wild Turkey has disappeared since the time of my first visits.

There are few birds of prey, largely because the natives have a strong antipathy to them and shoot as many as they can. Still I know of one place on Negro Mountain where a pair of redtails may be seen year after year. At another place a pair of sharpshins has been holding forth for ten years, and were there at my last visit, much to the disgust of nearby Kingbirds, whom I have seen darting at one while fairly screaming with rage. The Sparrow Hawk had at this list visit disappeared from its accustomed haunts.

The Mourning Dove breeds sparingly. Both cuckoos are regular breeders. A nearly full-grown Black-billed Cuckoo I saw on my last visit had whitish edgings to the feathers of the tail and back and thus looked remarkably like an European Cuckoo.

Of woodpeckers the Flicker is the most common. Formerly it was the red-head, but this has strangely almost disappeared. What can be the reason? There are no longer quite so many dead trees in the clearings, but there are still enough to go around. Also the fine cherry trees are still there. So why should they have become so rare? What hidden influences are at work in nature that work for the increase or decrease of species of animals or plants and even eliminate some entirely? We do not seem to be making much headway in that line of investigation. The fine Pileated Woodpecker is still found in one place on Negro Mountain, his hold on existence being evidently precarious. The Downy and Hairy Woodpeckers occur, but by no means as numerously as one would expect in such a relatively heavily wooded region. The northerly Yellow-bellied Sapsucker comes as a distinct surprise in a region as far south as Maryland; it can be found every summer and all summer on Negro Mountain, and probably in other suitable places.

The Nighthawk can be seen circling overhead in small numbers here and there, but the Whip-poor-will has almost gone entirely. The same condition I find to be true wherever I go and where it was formerly common. What can be happening to this fine species? I have heard of a few places where they are just as numerous as before, if not more so. I hope there are many such. Chimney Swifts and hummingbirds are here, of the latter I have found a nest with young.

In my journal of 1918 I find this entry made during my visit at Accident: "Every orchard has a pair of Chebecs, and every second one a pair of Kingbirds and Baltimore Orioles." This had distinctly changed for the worse in 1928, when I saw no Least Flycatchers at all, and fewer Kingbirds and Orioles. The Wood Pewee is common and the Phoebe was formerly, but is no longer. Of the Phoebe the same remarks hold good as of the Whip-poor-will. This year even the old wooden bridge or culvert over Big Bear Creek, near Kaese's mill did not harbor a pair, where in other years one could always be sure of finding one. What is happening to them?

The Prairie Horned Lark is still found breeding in a few places. This part of Maryland is probably the only one where it is found as a breeding species. At Cumberland it is only a migrant.

The crow and jay family is not strongly represented here. Blue Jays are common enough, as indeed they seem to be everywhere, but the crow is far from plentiful.

Of the blackbirds and Starlings only the Bronzed Grackle which seems here to be intermediate between this species and the Purple Grackle, can be called common or even abundant. Wherever there is a little alluvial, swampy tract along a creek, the redwing is certain to be found, as on the swampy, alder-covered glades on Negro Mountain, and on Big Bear Creek. Here I once found a nest of a pair in an apple tree twenty feet up. The Baltimore Oriole has decreased in numbers, the Cowbird holds its own, unfortunately, and the Bobolink is nesting in small colonies in timothy fields. It is, if anything, increasing in numbers, which is rather astonishing for a state as far south as Maryland. It does not think of nesting near Cumberland. The Meadowlark is only moderately common.

An unwelcome addition has appeared here in the Starling. There was a band of about forty roving about. They were feeding in a newly-cut hayfield, then in cherry trees that had not been picked. When flying overhead, they can at once be told by their short tail, which is quite different from that of any of our blackbirds, and by their rapid flight. I tried to get a few specimens, but found them

extremely wary and unapproachable. Later, in Cumberland, I found them voraciously feeding on pears in the garden of my host, where I could have gotten some easily. The way they slashed into those pears, not troubling about finishing up such as dropped to the ground, seems to me to spell trouble to fruit-growers in the future, if they become plentiful, which seems probable.

The finch and sparrow family is well represented here. The Chipping Sparrow and the Song Sparrow are dooryard birds, breeding in every garden. The song of the Vesper and Grasshopper Sparrows can be heard wherever the roads wind through fields. In the low, warmer hollows the Cardinal is even represented there and on the hills the Indigobird as well. The Rose-breasted Grosbeak is not too rare a breeder. The Goldfinch was extremely abundant in 1928; one was hardly ever out of hearing of its voice. This species is distinctly on the increase wherever I have been in the last two or three years, in Illinois, Indiana, West Virginia, and Pennslyvania. That the Swamp Sparrow is found here comes in the nature of a surprise. They are found only in the cold, swampy glades on Negro Mountain and near Oakland.

The most interesting finch of the region, however, is undoubtedly the Carolina Junco. This lives and breeds from an elevation of about 2500 feet up, in dark, mossy hemlock banks as well as in the high, dry, rocky stands of chestnut, which latter are rapidly being replaced by other second growth, as we have seen above. Their appearance and song is exactly like that of *Junco hyemalis*, but the tail noticeably averages a little longer. One I saw and heard on my last visit had an entirely different song in this wise: *la la la la la* (loud and musical) *dree dree dree*, the last rasping and warbler-like. There were several warblers breeding in that immediate vicinity, so it got this song probably by imitation. The young are heavily streaked above and below.

Barn and Cliff Swallows are common, the latter even more than the former. Long lines of old and young of both species were strung out on telephone wires, while I was trying to stalk the Starlings. One large nesting place of former years on a certain barn had, however, been deserted by the Cliff Swallows, perhaps due to depredations of English Sparrows, who wanted to use their nests for their own families. Near Oakland I once saw a breeding pair of Tree Swallows. I did not notice any Purple Martins during any of my last visits, but there was a large colony of them at Cove, about four miles north of

Accident, and there are many at Frostburg, on the slope of Big Savage Mountain, twenty-five miles away.

Cedar Waxwings are common, shrikes absent, and of vireos only the Red-eyed, which tries to make up by its numbers the lack of the others. Just once I saw the Yellow-throated Vireo.

It is the warblers that are a revelation to anyone first visiting this region. They were to me at any rate. I thought I had been suddenly transported to Canada. There were and are there now the Black-throated Blue (which later turned out to be Cairn's) and Green, the Magnolia, the Blackburnian, and the Canada Warblers, the Northern Water-Thrush, beside such wider-ranging ones as the Parula, Maryland Yellow-throat, Chestnut-sided, Yellow, and Oven-bird; also more southerly ones as the Louisiana Water-Thrush, Golden-winged Warbler, and even the Chat, which was here one year only. At my last visit this year, the warblers gave me another surprise by their greatly diminished numbers. Thus, where I had seen twenty Canadas in 1918, there was this year only one; on Negro Mountain where in 1918 I counted twelve, there were none this year. The Magnolia stands ten to three, the Chestnut-sided fifty to three, Cairn's ten to four. Again, why this difference? Was it on account of the cold, wet spring they had this year? That is not improbable. My host had found several dead Flickers after a snow-storm they had in April. If such hardy birds succumb, how much more the tender warblers? But for all we know there may be entirely different forces and influences at work that make the numbers of birds fluctuate so strangely.

Of thrashers, the Catbird is common, the Brown Thrasher much less so. Wrens are represented by the House Wren and Bewick's Wren. The former seems to be increasing, the latter decreasing in numbers. I suspect that in this case the presence of the former is the reason for the decrease of the latter. Once only did I find the Winter Wren breeding, and that in a place which seems to be a bit of Canada bodily transported here—a stand of original hemlock and white spruce on Negro Mountain. There also the Blackburnian Warbler is in its glory.

The White-breasted Nuthatch is not common, not even the Chickadee. The Tufted Titmouse, so common at Cumberland, is entirely absent here.

Of thrushes the Veery was always common, locally even abundant. On the mountain crests and sides, as well as in the ravines one would every few steps hear their querulous alarm note. This year we did not see one, although we searched for them. How can

that be accounted for? Neither did we see or hear a single Wood Thrush. The Robins, on the contrary, are becoming more numerous—thirty years ago there were few here—and the Bluebirds are holding their own. On George's hill we came across a band of twenty to thirty Bluebirds busily feeding on red elder berries (*Sambucus canadensis*) and a little lower down one of ten to twenty gorging themselves on pinchberries. So it seems that when Bluebirds disappear from their haunts in July, they are simply congregating in places where wild fruit abounds.

Concordia Teachers' College,
River Forest, Ill.

FRANKLIN HIRAM KING*

BY MRS. H. J. TAYLOR

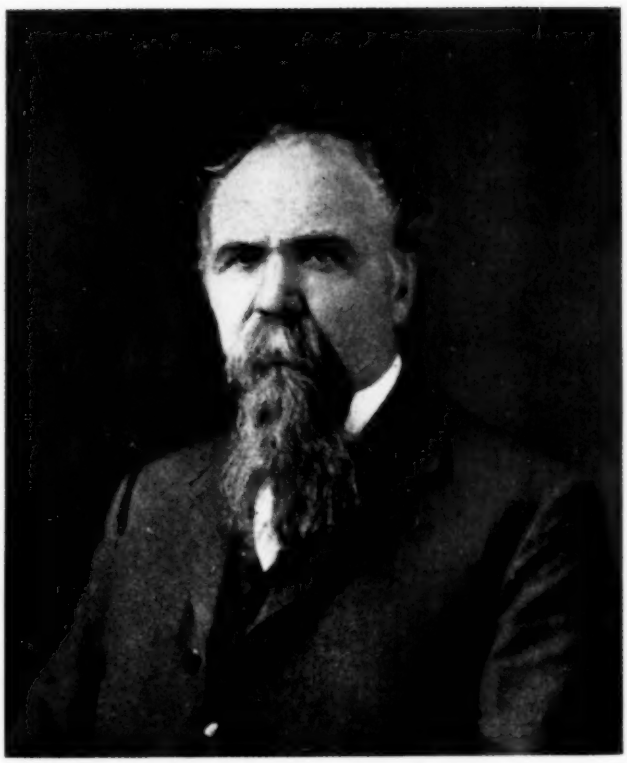
Franklin Hiram King was born near Whitewater, Wisconsin, on June 8, 1848. He died at Madison, Wisconsin, on August 4, 1911.

The only school in which Professor King graduated was the State Normal School, now called Teachers' College, at Whitewater, in 1872. After his stay at Cornell University, mentioned below, he spent a summer at Beaufort, N. C., in the biological station then maintained by Johns Hopkins University. In 1910 the University of Wisconsin conferred upon him the honorary degree of Doctor of Science.

From 1878 to 1888 King taught in the Normal School at River Falls, Wisconsin. In 1888 the University of Wisconsin called him to the Chair of Agricultural Physics, the first of its kind in America. He prepared his own textbook for this work. It was so successful that six editions were published. He remained in this connection until 1901. From 1901 to 1904 he held the position of Chief of the Division of Soil Management, in Washington, D. C.

King's contribution to economic ornithology consists of a paper entitled "Economic Relations of Wisconsin Birds", published in the "Geology of Wisconsin" (Survey of 1873-1879, Vol. I, Part II, pp. 441-610). King began working on this subject in 1873. In 1875 the State of Wisconsin invited him to make an official report on the economic importance of birds in relation to agriculture. He then realized the necessity of a thorough knowledge of insects. He began to

*Mrs. Taylor published a sketch of F. H. King as a part of another paper in the Wilson Bulletin, XLIII, September, 1931, pp. 188-189. In the meantime additional material has been obtained, together with a portrait of Professor King. At the Editor's request Mrs. Taylor has re-written this sketch, incorporating both the old and new material.—Editor.



Franklin Hiram King, 1848-1911

make collections of insects in order that he might become acquainted with them for purposes of identification. He also observed them at work, and studied what was known concerning their beneficial or harmful effects on farm crops.

Beginning in the fall of 1876, he spent two years at Cornell University, pursuing the study of entomology.

King was born and chiefly educated in Wisconsin, and became a teacher in her highest institutions of learning.

King's interest in ornithology was wholly incidental to the major interest of his life—agriculture. So, we find his attention reverting to farming in the broadest sense. It was his desire to share his specialized knowledge with those who were actually tilling the soil, dairying, or feeding cattle.

In 1895 he published a book on "The Soil". This was followed in 1899 by "Irrigation and Drainage". This book is not a discussion of the general subject of irrigation and drainage with reference to arid tracts and swamp lands. It treats only of the cultural phases of the subject and presents specifically the fundamental principles which underlie methods of culture by irrigation and drainage. The farmer, the horticulturist, the gardener, must have a clear understanding of the relations of water to soil and to trees and plants, in order to act rationally in controlling the moisture of the soil.

The five years following his sojourn in Washington were spent in writing and lecturing. In 1908 he published "Ventilation for Dwellings, Rural Schools, and Stables". This book was enthusiastically received by the general public. It contained important information presented in language which the layman could understand. *Hoards' Dairyman* said of this book: "The subject is so widely and strongly, and so profoundly treated . . . that we are sure that it will be regarded by all classes of society as one of the most important contributions to human knowledge that has yet appeared. All the knowledge Prof. King uses exists in the great domain of scientific investigation. But it is here brought down to the average comprehension in a way that makes it of the greatest importance to every household in the land." This little book of 125 pages did its work well in educating all classes to the need of fresh air, sunshine, and sanitation. Today these things are accepted as a matter of course.

A letter received from Mrs. King in September, 1931, says: "In 1909 Mr. King went to China, Korea, and Japan in a pilgrimage to learn, if possible, what an older soil management than that of this country or Europe had accomplished. He had planned much writing

as the result of that study, when his death occurred suddenly on August 4, 1911. He had finished the preparation of his book, 'Farmers of Forty Centuries', except the last chapter, which was never written." The typesetting for this book was started on the day of Kings' death. It was published in Madison by Mrs. King. In her letter she states: "The first edition was 1000 copies. The second edition was 4000. In 1927 a third edition was issued in London. The latter edition does not contain quite all the earlier ones do. A few of the illustrations and some of the more personal things were left out."

It can scarcely be doubted that "Farmers of Forty Centuries" did not reach the public as it would have had King lived. Local printing could not give a book the publicity which a publishing house gives. Nevertheless, the book received many favorable reviews from many sources. And it also received the first award from the Grant Squires Fund. Among the reviews we may mention only one or two. Dr. J. Kawaguchi, Director of the Agricultural Station, Japan, wrote: "Mr. King's 'Farmers of Forty Centruies' is the greatest work written in a European language to set forth the conditions of our Oriental agriculture." *The Living Age* said: "Professor King's book has all the interest of a book of travel, but it has much greater value, for the author's observations went deeper than those of the ordinary traveller."

This book, covering forty centuries of farming, is more fascinating than one might suppose. In it the author tells how successful an ancient people have been in cultivating their lands and keeping their soil productive over a period of 4000 years. He shows the young and boastful new world that it has still much to learn from the old. This book is, doubtlessly, to be regarded as the climax of Professor King's life. Yet, in our field, cognate to agriculture, we recognize his early studies on the food habits of birds, by the method of stomach examination and by the method of field observation, as a fundamental and pioneer contribution.

Berkeley, California.

SUMMER WARBLERS OF THE CRAWFORD COUNTY, MICHIGAN, UPLANDS

BY LEONARD W. WING

Little ornithological work has been done in Crawford County, Michigan. A few ornithologists have visited there, but no systematic study has been undertaken. My own work centers in the northeast corner of the county, about latitude 44°. Crawford County is a region of both upland and lowland. Publication of these notes on the uplands seems warranted at this time, because they provide a new breeding bird for Michigan (Palm Warbler), and add considerable data for others. It is hoped eventually to have a list of the birds of the county prepared and published, but a great amount of field work there still remains to be done.

I am indebted to Wm. G. Fargo for assistance in the field work and preparation of the manuscript, and to Milton B. Trautman for notes on his work in the county in 1925-6. I have received further assistance from A. D. Tinker and R. E. Olson, who have very kindly loaned me their notes. They have worked in the county both with me and independently.

The soil of Crawford County is mostly sand and gravel, consequently there is little successful agriculture. The northeast corner is typical of the whole country. It is wild and uninhabited. The North Branch of the Au Sable River flows southeast across the northeast corner. The North Branch follows roughly the inner edge of a terminal moraine. Back of the moraine, to the north and east, is a large outwash plain. The hills of the moraine are well rounded and rise not more than a hundred feet above this plain. The edge of the moraine, facing the plain, is a steep bluff-like slope.

The moraine was originally covered with a heavy white pine (*Pinus strobus*), red pine (*Pinus resinosa*), and mixed hardwood growth. The timber was removed forty or fifty years ago. Forest fires have burned the area many times, so that it is now a region of charred stumps and brush. A few red pines that survived the lumbermen and escaped the fire are occasionally found. They still bear deep fire scars.

The chief brush of the country is maple (*Acer saccharum*). The fires have burned the young trees so many times that they are now large clumps of suckers. There are numerous patches of thorns (*Crataegus*). Sweet fern (*Myrica asplenifolia*) grows luxuriantly and practically completes the cover.

North of the river there is a jack pine plain. It is situated on the outwash plain previously mentioned and is composed of Grayling sand. This jack pine plain is quite typical of nearly all such plains of Michigan. They are all more or less primeval and appear to be much as before the arrival of the white man. What little white and red pine remained scattered over the plains has been taken off. The jack pine has little commercial value, so has been left untouched by the lumberman. There are numerous scattered burns over the plains and in many places they have grown up into a short jungle-like growth "as thick as timothy hay".

The particular burn near the river where I carried on my investigations was formerly covered with large jack pines. The trees were thirty to sixty feet high with trunk diameters of six to ten inches. Most of the tall trees fell, though some still stand as stubs. The heat from the fires aids in liberating the seed. The jack pine is very prolific; the seed is very hardy and has a high germination percentage, so that thousands have sprouted and lived, to form, in 1930, a mass of fresh growth six to twelve feet high. In places it is so thick one has great difficulty in working through. It is so dense that the lower branches die young. Here, close to the ground, where it is open, we generally find our birds, and it is only by working low that they may be observed. The plains are very deficient in food in early summer, so that when the birds are not singing it takes an almost unbelievable amount of peeking and peering to locate them.

Black and White Warbler. *Mniotilta varia.* August 6, 1931, I secured an immature bird from a mixed flock in the jack pine burn. The flock consisted of Chipping Sparrows, Nashville Warblers, and Chickadees. I do not think that it nests in the uplands but moves into the jack pines after the nesting period.

Nashville Warbler. *Vermivora ruficapilla ruficapilla.* This is a common nesting bird of spruce and cedar swamps. As soon as the young are able to fly, the whole family seems to move into the jack pines. June 30, 1930, great numbers of them were in the jack pines east of Grayling. I collected a male and a juvenile on that date. August 6, 1931, I found a flock of old and young in the burn near the North Branch, collecting two. The young, though well able to fly, constantly begged for food. On June 30 the males were singing even when feeding the full-grown young.

Myrtle Warbler. *Dendroica coronata coronata.* July 21, 1930, Josselyn Van Tyne and I collected a juvenile female Myrtle Warbler in the burn near the river. July 5, 1931, I secured a juvenile male

and female. The same day Mr. Tinker also took two, an adult male with a juvenile. August 7, N. A. Wood and I collected two more young birds. The Myrtle Warbler breeds in the swamps and appears to enter the jack pine only after the nesting season.

CHESTNUT-SIDED WARBLER. *Dendroica pensylvanica.* The Chestnut-sided Warbler is an abundant warbler of the hills south of the river. Mr. Trautman found them abundant in 1925.

KIRTLAND'S WARBLER. *Dendroica kirtlandi.* Kirtland's Warbler is a very common warbler of the jack pine burns. Due to the restricted number of suitable burns, it is doubtful if more than four or five thousand individuals are in existence.

The song and method of delivery of Kirtland's Warbler is decidedly unlike that of any member of the genus *Dendroica* of which I have field knowledge. I find no citations in literature that indicate a song approaching it. The song is loud, clear, and ringing, delivered with a tremendous gusto. The bird throws the head back, the body assumes a perpendicular attitude with the tail projecting downward. The notes seem to shoot forth, the body trembling with emotion. I have written this song as *ba tu' tu' weet' weet'*, accented as indicated.

Occasionally another song is heard, but I have not determined its significance. It may be expressed as *butte butte weet" weet" weet" weet"*. There is no inflection and the accents are slight, as indicated. It is reminiscent of the alarm call of the Wood Thrush.

Kirtland's Warbler is probably a very old species. Its high specialization and restricted habitat leads one to believe that it has reached (and perhaps passed) the climax of racial senescence. The plumage, when compared with other members of the genus, shows that at similar molts it is in earlier stages of development. It retains the pattern of the early plumage for some time. It appears that at least two years are required for the complete plumage.

A number of other members of the genus, as mentioned elsewhere, share with the Kirtland the habit of tail-wagging. *Dendroica castanea* and *Dendroica striata* also show traces of this habit when young. It leads to the conclusion that this is an old character that is being lost. Some species have completely lost the habit, while others exhibit it in early life. This indicates a recapitulation of the tail-wag.. If so, we can readily perceive the direction of evolution of this habit.

The conclusions from the plumage and tail-wag agree in placing Kirtland's Warbler as the most primitive member of the genus. Possibly we may interpret the distinctive song in the same way.

If this is the oldest form, it is interesting to speculate on what the *dendroican* ancestor was like. It may have been a heavily streaked bird, living in a dense jungle. It probably had a very loud song, and continually wagged its tail. In the subsequent evolution of the race, this form failed to keep pace. Perhaps we should consider it as a sub-genus.

Pine Warbler. *Dendroica vigorsi vigorsi.* The Pine Warbler is an abundant bird of the larger and older jack pines. Young fully-grown birds are found by the first of July. The adult birds stay in the taller jack pines except after the young are flying. Then they will be found in the burns with the young.

The song of the Pine Warbler is a simple trill. It is extremely difficult to distinguish it from the songs of a number of other species of the same general territory. The Eastern Chipping Sparrow (*Spizella passerina passerina*), Slate-colored Junco (*Junco hyemalis hyemalis*), Myrtle Warbler, and palm warbler, all have trills that resemble the song of the Pine Warbler. It is quite impossible for the listener to distinguish them with certainty. Musicians say that some of these songs are reiterations of the same tone, rather than trills.

The young Pine Warblers occasionally wag the tail in the manner of palm warblers. The adults were not seen to do this.

By late June the post-juvenal molt begins. It is first noticed in the wing coverts where a few new feathers appear. The molt continues through July and is completed about the middle of August. The sex of the young Pine Warblers may be determined in the field by the middle of July, the males being much yellower than the females. The males acquire a yellow breast and brownish-olive back while the females acquire a grayish-brown breast with a slight tinge of yellow, and a brown back.

The adults molt later than the young. The beginning of the molt is not constant, probably caused by prolonged attention to the young. The earliest sign of molt appeared July 24 in the males and a little later in the females. It progresses rapidly; by August 7 most birds are growing new tail feathers to replace the old ones which were shed simultaneously. The edgings of the fresh feathers are olive in the adults, the same as in the young.

Western Palm Warbler. *Dendroica palmarum palmarum.* June 3, 1931, I collected a male palm warbler in the burn near the river. The specimen is now number 67489 (original number W258) in the Museum of Zoology. As far as we have been able to ascertain, this is the first breeding specimen for Michigan. June 14, two more palm

warblers were collected, and three observed. A female was flushed from the ground. She trailed the ground for some distance, so the nest was not discovered. July 4, a fourth specimen was obtained. The young bird was not out of the nest more than a week or ten days. I saw another adult with a young bird but did not get it. July 5, a female was taken. She was with a fledgling barely able to fly, but the young bird was lost in the thick jack pines.

H. A. Olsen and R. E. Olsen, accompanied by L. H. Walkinshaw of Battle Creek, visited the spot June 15 and found two pairs of palm warblers carrying food. They located three young not able to fly, which the parents fed while they watched. Unfortunately the birds were not collected, though they were photographed and banded.

Altogether, I found fifteen adults and six young, of which number five adults and one young were collected. The palm warbler appears to be a rare breeding bird in the jack pine country.

The palm warbler is not a shy bird. Sometimes it fed within a few feet of the observer. It is said to be terrestrial to a great extent, though I failed to notice it on the ground for any appreciable length of time. The birds appeared to feed exclusively on insects and worms gleaned from the jack pines. The individual bird's territory seemed to occupy but a few acres. In feeding it prefers the denser growth, spending most of its time in the lower branches, generally within a few feet of the ground. It works the branches very thoroughly in a manner identical with that of Kirtland's Warbler. In the thinner growth, it worked to the upper branches, generally spiralling around the tree, then flew or rather dropped to the lower branches of an adjacent jack pine.

The most noticeable characteristic of the palm warbler is the wagging of the tail. The young bird also wagged its tail, though it was scarcely a month old. As it was breeding with Kirtland's Warbler I had every opportunity to compare the tail-wag of the two. I would say that the tail-wag of Kirtland's Warbler is more pronounced than that of the palm, and it is delivered with greater vigor. The kirtland wags its tail more frequently and continuously and the arc through which the tail moves is longer than the corresponding arc of the palm.

On its breeding grounds, the palm warbler was heard to have two distinct songs and an ordinary warbler *chip*. The first song, which appears to be the song of the mated or nesting bird, is delivered from a favorite perch, generally the tallest pine in the bird's territory. It is given with the body erect, the head thrown back and the tail point-

ing straight down. I have written the song as *hee''-u hee''-u hee'-u hee'-u*. The first notes are delivered slowly; the last two a little more rapidly; they are higher pitched and accented as indicated. The whole song, however, is delivered in a slow, unhurried manner. The tone is rich, soft, and liquid. It has a cool, distant quality.

The second song, which may be the courting song, is almost indistinguishable from the songs of the Pine Warbler or the Eastern Chipping Sparrow. Indeed, it bears a striking resemblance to the song of the Slate-colored Junco and Myrtle Warbler. However, the Pine Warbler sings only from the taller, older trees; the Western Palm Warbler prefers the fresh growth. The song is a trill, sweeter and more musical than the song of the Eastern Chipping Sparrow and stronger than the song of the Pine Warbler. It is generally given while the bird is moving (sometimes very rapidly) through the jack pines. The singing bird stays in the same territory, though he circles a great deal. Occasionally a feeding bird bursts out with this song. It is heard oftener than the song first described. I have written it *weet weet weet weet*, with no inflection.

Northern Prairie Warbler. *Dendroica discolor discolor*. The distribution of the prairie warbler in Michigan is not very well known. In the past, observers have found it only in the southern part of the state and at rare intervals. May 10 to May 20, 1927, I found them in numbers migrating on Fish Point in Saginaw Bay. N. A. Wood found them on Charity Islands, also in Saginaw Bay, in 1911; Frothingham has reported seeing and hearing a male in an oak coppice near Higgins Lake, Crawford County, July 6, 1905. Kitteredge saw one near Lovells, July 3, 1927.

July 3, 1931, prairie warblers were located in the hills south of the North Branch. It is a common bird in the cut-over and burned-over lands. It frequents the heavier and thicker parts of the brush country. July 2, I collected a female constructing a nest. July 4, a male and a fledgling barely able to fly were collected.

The males are found singing from the tops of the many dead trees, from an occasional jack pine or the lower branches of a red pine. In the last case they generally select a tree without branches for the first forty feet. The birds usually feed in the lower branches though frequently they are seen on the ground under the bushes. A very noticeable characteristic of the prairie warbler is the wagging of the tail, which occurs in both sexes and the young. The tail-wag is much slower and intervals between movements much longer in the

prairie than in the palm warbler. The arc through which the tail moves is shorter that the corresponding arc of the palm warbler.

The males are shy when singing, yet allow close approach when feeding. Sometimes they permit the observer to come within a few feet without visible alarm.

The call of the prairie warbler is a soft *chip*. The song is distinctive and easily recognized. It is a series of five or six notes that rise in pitch and volume with each succeeding note. It can be written as *dee dee dee dee dee dee*. There appears to be no individual variation. The song is weak, yet in the hill country it carries amazingly great distances, often eighty rods.

The nest that I found was well concealed in a bunch of hazelnut shoots. It was constructed of grasses woven together and placed in a fork twenty-four inches from the ground.

Oven-bird. *Seiurus aurocapillus.* Frothingham lists the Oven-bird as common in the jack pine. I found them uncommon anywhere in the uplands, and, when seen, only near the edges of swamps. They are generally in the deciduous growth, though occasionally found in an old burn where the thick jack pines are from fifteen to thirty feet high.

Northern Yellow-throat. *Geothlypis thrichas brachidactyla.* The Northern Yellow-throat is not uncommon throughout the dry sandhills south of the river. It is found in the same general territory as the prairie warbler. The birds sing constantly and are not difficult to find. I did not hunt a nest, but Milton Trautman found one June 28, 1925. He says, "It contained four eggs, was on the ground within one foot of a decaying log and sheltered by a sweet fern".

American Redstart. *Setophaga ruticilla.* A. D. Tinker and R. E. Olsen found one in a fresh growth of jack pine near the river, May 30, 1931.

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Museum of Zoology, University of Michigan,
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EDITORIAL

WHAT is the best and surest way of describing the locality of specimens, so that the location will be intelligible one hundred years hence? We have recently had occasion to look over the lists of specimens compiled by Prof. S. F. Baird in Volume IX of the Pacific Railroad Reports, published in 1858. Localities which were then well known, doubtless, are now more or less puzzling. For instance, many records were credited to this and that place in Nebraska Territory. But at that time Nebraska Territory included Wyoming, Montana, and both Dakotas, besides the present state of Nebraska. Political boundaries, even though they seem to be more stable now, are subject to change in a hundred years. We note also that many records are attributed to islands in the Missouri River. Even if these islands still exist some effort is required to locate them, since the abandonment of river traffic has removed our attention from the river and its islands. And the river, in cutting from one side of its flood plain to the other, has often changed the boundaries of states.

A great many records are located by the early frontier forts. While they are unfamiliar in many cases, they can be traced and related to present geography. Still other specimens are assigned to such obscure early localities as Pole Creek, Bijoux Hill, The Tower, Loup Fork, Little Blue, Iowa Point, Bridger's Pass, etc., etc., all somewhere within the boundaries of the present five states which then comprised Nebraska Territory. With such a method of location of specimens the zoologist will have to take his turn as historian and geographer. The only alternative we can see for him is to take training as astronomer and navigator, and locate his specimens with the aid of compass and theodolite. The authors of seventy-five years ago little realized how soon their locality terms would become obsolete; nor do we probably realize the changes which will take place in the next similar period of time. An unstable nomenclature is surely worry enough, without the addition of instability or uncertainty of location. Perhaps the only suggestion to be made is concerning the importance of including with every locality record, or list, a very full geographical description.

As an indication of the bibliographer's difficulty we may point out that the Volume IX previously cited lists Bridger's Pass, Nebr. (p. 19), Bridger's Pass, Utah (p. 312), Bridger's Pass, K. T. (p. 520), and Bridger's Pass, no state location (p. 40).

THE SKETCH of the life of Dr. C. W. Richmond by Dr. Stone in the *Auk* for for January brings to our mind again the loss which frequently comes to science in the death of men who work unostentatiously and whose labor is appreciated most after it ceases. Dr. Richmond had many friends among people who never had met him personally. There were two outstanding characteristics of Dr. Richmond to account for this, viz., his profound knowledge of ornithological literature and his exalted unselfishness. Apparently, he was always ready to share his knowledge, or go to some trouble to look up information for inquirers, and then to allow them the privilege of publication. And even more unusual it was that his kindnesses seemed to be just as available to strangers as to closer acquaintances. It is always a privilege to know such men, and a real loss not to have had the opportunity of acquaintance.

NO DOUBT the museums will always be concerned primarily with the preservation of organic remains, and hence will be dealing with morphological material. And so Dr. Stone was perhaps justified in taking exception (*Auk*, L, April, 1933, p. 251) to our rather sweeping comparison between modern morphological and physiological research (WILSON BULLETIN, XLIV, p. 231). Nevertheless, we do think that physiological researches are at present in the ascendency. And we believe that this is true not only in ornithology but throughout the entire range of zoology. This view will probably be easily verified by perusal of the zoological programs at any recent A. A. A. S. meeting. And in the ornithological field alone we may point to the work of Lillie and his colleagues in Illinois on feather pigmentation; and to the work of Miller in California on the same subject; to the work of Baldwin and his colleagues in Ohio on temperature; to the work of Shaver and his colleagues in Tennessee on bird song; to mention only a few of the more recent publications. The whole subject of territory behavior is wide open. Mrs. Nice's work on territory habit in Song Sparrows and other phases of behavior is another example. Perhaps most of the problems which are being solved by the aid of the bird banding method should be classified under the broad head of physiology.

GENERAL NOTES

Conducted by M. H. Swenk

A Partial Albino Red-tailed Hawk.—On April 14, 1932, the Pennsylvania State Game Commission received a partial albino female Red-tailed Hawk (*Buteo borealis borealis*) which had been killed a few days before at Bradford, Pennsylvania. Fifty per cent of the plumage was of abnormal color. The distribution of it was very irregular, but in nearly every case the feathers of each wing matched in color. In the tail the color of the sides was uneven. The eyes were too much damaged to show color. This is the first case of albinism I have seen in the fifteen birds of this species that I have skinned.—MERRILL WOOD, *Harrisburg, Pa.*

A Flight of Broad-winged Hawks.—On September 14, 1932, while standing on a little knoll at the outskirts of Dows, Wright County, Iowa, I saw a flock of thirty-eight Broad-winged Hawks (*Buteo platypterus platypterus*). The Iowa River here takes a southeasterly course, and the birds were strung along in the air over the river for a distance of perhaps two miles. After the manner of the White Pelican, they were circling and at the same time making progress with the course of the stream. They kept directly over the river and at varying distances above the trees. A few small groups of six or eight moved together, but the majority of birds were separated as individuals.

On September 21, 1932, I visited Backbone State Park in Delaware County, Iowa, accompanied by Fred J. Pierce of Winthrop. During the course of the day we counted 140 Broad-winged Hawks flying over. We estimated that they were about 500 feet over our heads. The birds appeared singly at times and at others from ten to fifteen in a group would wheel about in the air, each circle described carrying them a little bit farther southward. On one occasion, while we had our glasses on the birds, four Ruby-throated Hummingbirds crossed the field of vision at a height of about 100 feet and flying directly south.—CHARLES J. SPIKER, *New Hampton, Iowa.*

First Record of the White Gyrfalcon for Michigan.—A White Gyrfalcon (*Falco rusticolus candicans*), the first record for Michigan, was shot January 21, 1932, near Sault Ste. Marie, and is now in the University Museum at Ann Arbor. When shot it had just struck down a Greater Prairie Chicken. Ten years ago the Greater Prairie Chicken was practically unknown in the eastern part of the Upper Peninsula of Michigan, but now it is quite common in many places. This note was received from Mr. M. J. Magee, the well known bird bander of Sault Ste. Marie.—RALPH BEEBE, *Ecorse, Mich.*

The Pomarine Jaeger in South Dakota.—During the past fall a specimen of the Pomarine Jaeger (*Stercorarius pomarinus*) was sent to the Museum of Natural History of the University of Minnesota by Mr. Alfred Peterson of Pipestone, Minnesota. The bird had been taken on October 9, 1932, by Mr. R. A. Hyde near Madison, South Dakota. It was in the dark immature plumage, with the central tail feathers hardly appreciably longer than the other rectrices. An examination of the stomach contents revealed that it had recently fed on a portion of an adult Franklin's Gull (*Larus pepixcan*). This bird is known to prey on small birds, and if hard pressed, might be capable of taking a Franklin's Gull, but very likely it was playing the role of scavenger in feeding on this bird.—W. J. BRECKENRIDGE, *Museum of Natural History, Minneapolis, Minn.*

The 1932 Fall Migration at Cleveland's Public Square.—In my searches at the Public Square in Cleveland in the fall of 1932, I was successful in finding nineteen species of native birds. From August 29, when the first warbler appeared, a little greenish fellow of undetermined species, until December 17, when the one remaining White-throated Sparrow was last seen, I made eighty-nine visits and found birds on all but fifteen days. The season was somewhat warmer than normal. My records are as follows:

Species	First Record	Last Record	No. of Days Seen	Largest No. in one Day
Sparrow Hawk	Nov. 18	.....	1	1
Bob-white	Oct. 13	Oct. 15	3	1
Herring Gull	Nov. 1	Nov. 17	3	5
Northern Flicker	Oct. 7	.....	1	1
Yellow-bellied Sapsucker	Sept. 28	Oct. 1	2	1
Blue Jay	Oct. 1	.....	1	1
Winter Wren	Oct. 14	.....	1	1
Catbird	Oct. 1	Oct. 21	13	2
Hermit Thrush	Oct. 14	.....	1	1
Ruby-crowned Kinglet	Sept. 26	.....	1	1
Palm Warbler	Sept. 16	Oct. 13	12	3
Northern Yellow-throat	Sept. 24	Oct. 15	12	2
Savannah Sparrow	Oct. 4	.....	1	2
Tree Sparrow	Oct. 19	Nov. 23	3	2
White-crowned Sparrow	Sept. 23	Nov. 22	32	6
White-throated Sparrow	Sept. 23	Dec. 17	67	19
Lincoln's Sparrow	Sept. 23	Oct. 29	16	2
Swamp Sparrow	Oct. 7	Dec. 5	22	1
Song Sparrow	Sept. 26	Nov. 10	23	6

The most unexpected migrant of the season was the Bob-white which spent three active days about the one large bush in the Square, not particularly fearful of the many passersby. It arrived on a raw, windy day, probably forced down in a flight across the city. The Blue Jay flew about among the plane trees, screaming merrily, and followed by a dozen chattering English Sparrows. This must have been the first jay these city-bred sparrows had ever seen.

An idea of the length of time which individual birds may spend at the Square is indicated by the following. A tailless palm warbler showed up first on September 19 and was seen at intervals until October 3 when it had acquired a fair start at a new tail. This example, of course, might be considered a cripple, but the bird seemed to fly well. Incidentally this bird wagged its taillessness just as energetically as any completely equipped palm warbler.

The Starling population of the Square amounted to some 15,000 again this season and persisted in greater numbers than usual through the mild winter.—William H. Watterson, *Cleveland, Ohio.*

A Heavy Case of Internal Parasitism of the Belted Kingfisher.—A Belted Kingfisher (*Megaceryle alcyon alcyon*) brought to me on December 24, 1931, by Alden Risser, proved to be rather heavily parasitized. Mr. Risser reported that the bird was unable to fly more than a few rods, and it was easily taken in the hand after a few such flights. Since no external injuries were apparent it was thought at first that starvation may have caused the weakness of the bird, for most of the fishing grounds of the kingfisher are frozen in this region at the season indicated. However, the stream near which the bird was taken was open in many places, and an examination of the stomach contents of the bird disclosed the remains of two small fishes, only one of which could be identified, a stickleback (*Eucalia inconstans*).

It was then found that the body cavity of the bird was nearly filled, especially about the liver, with nineteen filariid roundworms. These worms have since been identified by E. E. Wehr of the U. S. Bureau of Animal Industry, as *Monopetalonema physalurum* (Bremser) Diesing. Since this species has thus far been reported only from Brazilian kingfishers (*Alcedo* spp.) it does not seem unlikely that the present species may, on closer study, prove to be distinct. The female worms were about twelve to thirteen inches in length and the males about

FIG. 3. Aerial view of the Public Square, Cleveland, Ohio. The Square is located slightly below the center of the picture. The view shows, to some extent, the isolation of the Public Square from other open territory which might afford food or shelter to wild birds. There are a few small trees and shrubs in the fore quarters of the Square, where many of the birds were found; others were observed on the lawn and flower beds. Mr. Watterson's note in this issue is the fourth successive, annual census of the birds of the Cleveland Public Square published in the June numbers of the WILSON BULLETIN.

six or seven inches, and nineteen such worms constitute a rather heavy infestation. Undoubtedly the blood of the bird must have been teeming with the microfilariae, but the bird had been dead so long when examined by me that a blood examination could not be made. In the particular group of roundworms to which this species belongs the larval worms are passed into the blood stream, from whence they are transferred to another bird usually through the agency of a blood sucking insect. Such a heavy infestation of the worms as the one here recorded was probably enough to account for the weakened condition of the bird. Another species of internal parasite, a fluke of the genus *Crassiphiala*, was pres-

ent in the intestines in large numbers, but there is no evidence that this worm has any pathogenic effect on the host.

In midwinter the Belted Kingfisher is not ordinarily present in Minnesota, except in very mild winters, and even then it is found only rarely. Certainly a bird with the filariid infection of the one here reported would not be able to migrate any great distance, and it seems entirely possible that others of the birds which do remain over winter may have been prevented from migrating by such parasitic infections, or other factors, tending to weaken them. It is true, however, that only a very small percentage of worm parasites have such serious effects on their hosts.—GUSTAV SWANSON, *Minneapolis, Minn.*

The Snowy Owl in Iowa.—The recent papers by Gross (*Auk*, XLIV and XLVIII) and Hicks (*antea*, XLIV) very ably supplement the investigations instigated by Ruthven Deane relative to the periodic invasions of the Snowy Owl (*Nyctea nyctea*) into the United States and southern Canada. These invasions were found to have been most pronounced during the winters of 1876-77, 1882-83, 1889-90, 1892-93, 1896-97, 1901-02, 1905-06, 1917-18, 1926-27, and 1930-31.

In the summaries treating of these occurrences there appears to be a lack of Iowa records, from which one might conclude that the birds had not been present. Such has not been the case. Anderson (*Birds of Iowa*, 1907) cites records of one in Kossuth County in 1900; nine in Mitchell County during the winter of 1883-84; and many in Woodbury County during February, 1883. Widmann (*Birds of Missouri*, 1907) lists records of this owl at Keokuk, Lee County, on November 20, 1895, and December 6, 1886. Bailey (*Bull. 6, Iowa Geol. Survey*, 1918) indicates the occurrence (without dates) of this species in the following Iowa counties: Lee, Des Moines, Van Buren, Lucas, Decatur, Madison, Mills, Boone, Johnson, Cedar, Linn, Benton, Winneshiek, Floyd, Winnebago, Palo Alto, Clay, Buena Vista, and Woodbury. Stephens (*Proc. Iowa Acad. Sci.*, XXV, 1918) gave a useful summary of the Snowy Owl in the Missouri Valley, near Sioux City, from 1900. He states that, "In going over Mr. Anderson's records I find that he has mounted forty-six specimens of Snowy Owls between 1900 and 1917. While he has never had so many in one season as in this year, yet in the winter of 1905-06 he received thirteen specimens." A list of forty specimens taken or seen during the winter of 1917-18, is contained in this paper, of which twenty-three were from Iowa. Recently Youngworth (*antea*, pp. 32-33) recorded four occurrences of the Snowy Owl during December, 1929, January and February, 1931, in southwestern Minnesota and southeastern South Dakota.

Probably the most important records that we have of the Snowy Owl in Iowa, South Dakota, and Nebraska are contained in the material secured by D. H. Talbot and his collectors between the years 1884 and 1887. The forty-nine specimens in this collection, now in the Museum of Natural History, University of Iowa, are from the following localities: Twenty-three are from northwest Iowa; eight are from (South) Dakota; one from Nebraska; and seventeen without locality. Most of these specimens were sent to Talbot by hunters, but some few were secured on his farm in Woodbury County. The fact that Talbot could accumulate such a number of these birds, during seasons which were not generally recognized as invasion years, leads to the conclusion that the Snowy Owl formerly, at least, was a more or less regular winter visitor into the northwestern corner of the state.

In addition to the twenty-three Talbot specimens listed below, the Museum contains three other Iowa specimens; two from Johnson County (one without date, the other March 17, 1890); and one from Forest City, Winnebago County, March, 1901.

Museum No.	Sex	Locality	County	Date
8752	Male	Sioux City	Woodbury	March 17, 1884
8768	Female	Bradgate	Humboldt	Dec. 17, 1884
8722	Male	Aurelia	Cherokee	Jan. 13, 1885
8714	Male	Sioux City	Woodbury	Dec. 12, 1885
8711	.....	Sioux City	Woodbury	Dec. 23, 1885
8743	.....	Alta	Buena Vista	—— —, 1885
8777	Male	Jolley	Calhoun	—— —, 1885
8731	.....	Hawarden	Sioux	Jan. 3, 1886
8717	Male	Sibley	Osceola	Jan. 19, 1886
8770	.....	Sioux City	Woodbury	March 7, 1886
8746	Female	Sloan	Woodbury	Dec. 17, 1886
8747	Male	Merrill	Plymouth	Jan. 23, 1887
8772	Male	Plover	Osceola	Jan. 24, 1887
8744	Male	Sheldon	O'Brien	Jan. 25, 1887
8736	Male	Sioux City	Woodbury	March 14, 1887
8737	Male	Sioux City	Woodbury	March 15, 1887
8751	Male	Sioux City	Woodbury	March 17, 1887
8767	Male	Hospers	Sioux	March —, 1887
8727	Female	Sioux City*	Woodbury	April 16, 1887
8741	Female	Sioux City	Woodbury	—— —, ——
8778	Male	Little Sioux	Harrison	—— —, ——
10379	Male	Sioux City	Woodbury	—— —, ——
10382	.....	Rock Rapids	Lyon	—— —, ——

*Died in captivity.

—Philip A. DuMont, *Museum of Natural History, University of Iowa, Iowa City, Iowa.*

The Blue Goose in Kentucky.—On March 13, 1933, when the great tornado came in this vicinity, three Blue Geese (*Chen caerulescens*) "blew in" at my temporary lake near here, the first I have ever seen outside a zoological garden. I have visited the three geese twice, and have found them fairly tame. They probably were attracted by some Canada Geese which have been on this farm for many years. Several times I made them fly to be sure that I was seeing all their colors; they would circle around over the fields and come back to the same pasture where they had been feeding. Two are adults, the other immature. On the same temporary lake, which has again been large this winter, I have seen Mallards, Pintails, Blue-winged Teal, Coots, Yellow-legs, Wilson's Snipes, Pectoral Sandpipers, and hosts of ducks that were too far away for me to be sure of, even with my glasses. Yesterday there were some 500 ducks alone on the pond. The water is now over about 100 acres, but it has been more than twice that high this winter.—Gordon Wilson, *Bowling Green, Ky.*

Early Snowy Owl Records from Nebraska, Iowa, South Dakota, and Minnesota.—Following Mr. DuMont's note seems to be a proper place to record some relatively early captures of the Snowy Owl in the Missouri Valley country. So far as I know, none of these records has been published previously. All of the specimens here noted were mounted by Mr. A. J. Anderson for hunters who wished to have them for trophies or for ornamental purposes. Mr. Anderson was the leading taxidermist in Sioux City for many years. In later years, after

making contacts with other ornithologists, Mr. Anderson was careful to sex his specimens and also to attach a serial number to all specimens handled by him. The earlier specimens lack both number and the sex designation. The data for locality and date were copied by me from Mr. Anderson's ledger book records two or three years before his death in 1923. So, in this tabulation of material, only two data can be given for each specimen.

December	30, 1900.	One, probably from South Dakota.
January	21, 1902.	One, from Crystal Lake, Dakota County, Nebr.
January	26, 1902.	One, from Mt. Vernon, S. D.
December	21, 1902.	One, from Marcus, Cherokee County, Iowa.
February	22, 1903.	One, from Struble, Plymouth County, Iowa.
February	10, 1904.	One, from Parkston, S. D.
February	19, 1905.	One, from Sioux City, Woodbury County, Iowa.
November	13, 1905.	One, locality unknown.
November	19, 1905.	One, from Struble, Plymouth County, Iowa.
November	29, 1905.	One, from Struble, Plymouth County, Iowa.
December	3, 1905.	One, from Sioux City, Woodbury County, Iowa.
December	13, 1905.	One, from Hinton, Plymouth County, Iowa.
December	13, 1905.	One, from Laurel, Cedar County, Nebr.
December	26, 1905.	One, from Woodbury County, Iowa.
January	3, 1906.	One, from Lake Park, Dickinson County, Iowa.
January	13, 1906.	One, from Menno, S. D.
January	29, 1906.	One, from Lake Park, Dickinson County, Iowa.
February	13, 1906.	One, from Zeeland, N. D.
February	15, 1906.	One, from Zeeland, N. D.
February	26, 1906.	One, from Zeeland, N. D.
December	8, 1907.	One, from Sioux City, Woodbury County, Iowa.
December	16, 1908.	One, from LeMars, Plymouth County, Iowa.
May	5, 1909.	One, from Crystal Lake, Dakota County, Nebr.
December	25, 1909.	One, from Ethan, S. D.
January	4, 1910.	One, from Milltown, S. D.
January	4, 1910.	A second one, from Milltown, S. D.
January	11, 1910.	One, from Hinton, Plymouth County, Iowa.
January	13, 1910.	One, from Milltown, S. D.
January	13, 1910.	One, from Wessington Springs, S. D.
January	16, 1910.	One, from Sioux City, Woodbury County, Iowa.
February	1, 1910.	One, from Wessington Springs, S. D.
February	4, 1910.	One, from Sioux City Bird Store, locality unknown.
February	10, 1910.	One, from Jackson, Dakota County, Nebr.
February	26, 1910.	One, from Curio Store, locality unknown.
February	28, 1910.	One, from Sioux City, Woodbury County, Iowa.
March	7, 1910.	One, from Sergeant Bluff, Woodbury County, Iowa.
November	13, 1910.	One, from Scotland, S. D.
January	16, 1911.	One, from Knight's Store, locality unknown.
January	21, 1911.	One, from Zeeland, N. D.
February	21, 1911.	One, from Aberdeen, S. D.
December	31, 1913.	One, from Freeborn, Minn.
February	20, 1914.	One, from Sioux City, Woodbury County, Iowa.
November	20, 1914.	One, from Curio Store, locality unknown.
November	21, 1914.	One, from Zeeland, N. D.
December	11, 1914.	One, from Centerville, S. D.
February	1, 1915.	One, from Centerville, S. D.

This list accounts for the forty-six specimens of Snowy Owls referred to in my previous paper (1918), except one which I have now eliminated because of uncertain data. With the publication of these notes, together with the Talbot specimens reported by Mr. DuMont, we have a fairly comprehensive history of the Snowy Owl, in what we have been accustomed to call the "Upper Missouri

Valley", over a period of nearly fifty years. The Anderson specimens listed herein make a good contribution to the flight of 1905-1906. And they also show a strong flight during the winter of 1909-1910 which seems not to have been hitherto recognized as a major flight.—T. C. STEPHENS, *Sioux City, Iowa.*

The 1932 Fall Flight of Ducks through Northwestern Iowa.—In connection with some waterfowl studies carried on in Clay and Palo Alto Counties, Iowa (Virgin, Round, Lost Island, Trumbull, and Elk Lakes, Green and Brown Sloughs) data were obtained on the 1932 fall flight of the species listed below. Clay and Palo Alto Counties are representative of the best waterfowl country in the state. Reference in this note is meant only to migrants, not to ducks breeding in the area.

Wood Duck. *Aix sponsa* (Linnaeus). The total number of these ducks seen did not exceed one hundred. They were observed from September 15 to October 12, being most numerous from October 9 to 12.

Hooded Merganser. *Lophodytes cucullatus* (Linnaeus). The flight of this species, if it can be called a flight, coincided with that of the Wood Duck. Possibly twenty-five were seen.

Ruddy Duck. *Erismatura jamaicensis rubida* (Wilson). This duck was seen frequently from September 28 to October 17. Probably several thousand passed through the region during the season. They were most abundant from October 11 to 17.

Shoveller. *Spatula clypeata* (Linnaeus). Shovellers were observed from September 27 to November 10, with the greatest numbers noted between October 12 and 19. They were quite common until forced southward by a three-day blizzard beginning November 8.

Baldpate. *Mareca americana* (Gmelin). Although this duck was not present in large numbers it was taken frequently by hunters. It was observed from October 1 to 17, particularly the last four days of the period.

Red-breasted Merganser. *Mergus serrator* (Linnaeus). Observations made on this duck were similar to those of the Wood Duck and the Hooded Merganser. Hardly enough were seen to constitute a true flight. About twenty birds were killed or observed between October 13 and 18.

Buffle-head. *Charitonetta albeola* (Linnaeus). Very few of these ducks were seen. A number were reported as having been killed around October 15.

Blue-winged Teal. *Querquedula discors* (Linnaeus). The heaviest flight of Blue-winged Teal occurred from October 15 to 22, and the birds were present in lesser numbers until forced out by the blizzard of November 8.

Gadwall. *Chaulelasmus streperus* (Linnaeus). Very few of these ducks were seen or taken, but the species was most conspicuous between October 16 and 21.

Lesser Scaup. *Nyroca affinis* (Eyton). This duck was plentiful throughout the fall until about November 10. The greatest numbers were observed from October 19 to 25.

Ring-necked Duck. *Nyroca collaris* (Donovan). Small numbers of this species were present during the month of October. They were almost always seen with the Lesser Scaup, and their flight, if a true flight, was at the same time.

Green-winged Teal. *Nettion carolinense* (Gmelin). Great numbers passed through this territory between October 21 and 25. Their presence was noted from the latter part of September until November 10.

Canvas-back. *Nyroca valisineria* (Wilson). This deep water bird was observed only on Virgin and Elk Lakes. Two flocks of between fifty and sixty were noted from October 25 to November 5. They were last seen November 10.

Redhead. *Nyroca americana* (Eyton). About two hundred birds of this diving species were seen on Virgin and Elk Lakes. The main flight was from October 27 to November 6. Between seventy-five and one hundred remained in that locality until November 10.

Pintail. *Dafila acuta tzitzihoa* (Vieillot). Migrating birds were seen from the latter part of September until November 10. The Pintail was one of the most abundant species, the main flight extending from November 5 to 10.

Mallard. *Anas platyrhynchos* (Linnaeus). Our most plentiful and most popular duck was present in large numbers from the latter part of September throughout the fall and winter. The strongest flight took place between November 5 and 10.

Black Duck. *Anas rubripes tristis* (Brewster). Although few ducks of this species were taken, I suspect that migration was contemporaneous with that of the Mallard.

The fall flight of 1932 through this region was early. By the end of October all species of ducks except the Mallard and Pintail had reached the peak of their migration; the final flight of the latter two was precipitated by the snow storm and cold weather of November 8. Virtually the only ducks remaining after November 10 were several thousand Mallards that spent the winter on Round Lake.—Logan J. Bennett, *Ames, Iowa.*

An August Day's Toll of Birds' Lives on Primary Iowa Roads.—Like many other travelers by auto, the author at times has busied himself by counting the remains of dead birds on the road ahead. Several times he has pondered over the number of birds that might be destroyed in one day on the primary roads of the state. Last August (1932) opportunity was afforded to get an estimate of the numbers destroyed daily. Several days about the middle of August brought us successive heavy rains that, with the assistance of the auto wheels, swept the roads clean of all refuse. August 18 was mostly clear and the dead birds accumulated to remain on the highway. After the start at 7:30 A. M., August 19, the author, driving thirty miles on pavement north and west of Ames, counted as dead twenty-three English Sparrows and one adult Red-headed Woodpecker, victims of August 18. The locations of the remains were recorded by speedometer readings. On the morning of August 20 observations made during a drive over the same thirty miles added seventeen English Sparrows, four Red-headed Woodpeckers (three adult, one immature), and one Northern Flicker to the toll, as the kill of August 19. In those two days at least forty English Sparrows, five Red-headed Woodpeckers, and one Flicker were in the toll of bird lives taken over thirty miles of pavement; and the average was twenty-three birds per day. If the same ratio held true for each of the 7,290 miles of improved primary highways in Iowa, a day's kill in August might total 5,589 birds of which English Sparrows might number 4,860.—George O. Hendrickson, *Iowa State College, Ames, Iowa.*

Notes on Waterfowl in Central West Virginia.—Since published records of water birds in West Virginia are scarce, I will record some recent observations. On the morning of November 2, 1932, we had what was, for central West Virginia, an unusually heavy flight of wild ducks and geese. On that morning I was fortunate enough to be taking a group of students on a field trip along the Buckhannon River, in Upshur County, and we recorded five flocks of geese and twenty of ducks in an hour. Most of the ducks were scaups, but two which alighted quite close to us were Shovellers. These were carefully observed with 6x glasses. Later in the day I examined a specimen of Bufflehead killed by Mr. B. A. Hall of Buckhannon, West Virginia. Both of these latter ducks are considered rare in this state.

On December 26, 1932, I saw an American Bittern flying along French Creek, in Upshur County. This is an exceedingly rare winter species in this locality.—Maurice Brooks, *French Creek, W. Va.*

Winter Range of Tufted Titmice.—Tufted Titmice (*Baeolophus bicolor*) have visited my traps during only three of the six winters that we have spent in Columbus, namely, 1927-28, the following fall, and 1932-33. They were here in considerable numbers from October to the middle of April, and thirteen were banded with aluminum and celluloid bands. During the early part of the winter the birds remained in small flocks with definite ranges; the flock of eight birds which fed daily at my shelf trap ranged over about twenty acres. Other flocks of approximately the same size were met to the north, west, and southwest of the home flock. The latter part of February the flocks broke up and I began to catch my banded birds (as well as unbanded ones) in the traps set for Song Sparrows (*Melospiza melodia beata*) more than a quarter mile from our house, besides getting two new birds in the range of the home flock.

The weights of the titmice varied between 20.3 and 25.3 grams, the median of thirty-five findings being 22 grams. The lightest bird yielded six weights ranging from 20.3 to 23.7 grams, the heaviest seven weights ranging from 23.1 to 25.3 grams. No tendency to grow fat in winter was found with these birds, in contrast to the behavior of the Song Sparrows here.—Margaret M. Nice, *Columbus, Ohio.*

A Day with the Bald Eagles.—On March 2, 1933, I visited a few nests of the Bald Eagle (*Haliaeetus leucocephalus*) which were already known to me in James City County, Virginia. After breakfast we headed for Jamestown Island, where Captain John Smith and the early Virginia settlers landed. There were two eagle nests on the island which had been used each season for at last twenty years, and collecting eggs from a place so rich in historical interest appealed to me more than usual, so the trip was anticipated with much pleasure. The Bald Eagles of this section of the state invariably build their nests in live original growth long-leaved pines (*Pinus palustris*), and never build in dead trees like the Ospreys nearly always do. Sometimes the tree dies after they have had their nest in its for a number of years, and where this occurs they will continue to use the nest until it falls. The nest is never found far from water, as their food supply comes from the rivers and ponds where fish, ducks, and muskrats can easily be procured.

We drove the car to the lower end of the island, and parked only a few hundred yards from the nest. Nest No. 1 was in a pine growing along the edge of the tidewater marsh, and before we reached the tree the old white-headed

female eagle left the nest, and the racket that she made soon brought her mate to the scene. They both circled around the tree continuously, but did not come very close to us. The nest tree was not as large as those usually harboring eagles' nests, so getting to the nest was not much trouble. To reach the top of the nest was another problem, and it took nearly an hour to pull out part of the bottom and side of the nest so as to clear up a limb on which to climb around the nest. With a very high cold wind blowing in from the bay this proved to be a cold experience, but the top of the nest was finally reached and the three eggs lowered to the ground in a binocular case. These eggs proved to be odd, in that they were glossy like the eggs of the woodpeckers. Incubation had gone on about ten days. The distance from the ground to the top of the nest was seventy-seven feet. The outside of the nest was ten feet deep by five and one-half-feet across the top and seven feet in diameter near the middle. The interior was fourteen by five inches.

Nest No. 2 was supposed to be in a dead tree less than half a mile distant, but as the tree was in plain sight and no nest could be seen we knew that the tree had broken off with the accumulated weight of the nest. Before we reached the old tree we could see the nest in a green pine close by, and while still some distance away several deer which we jumped in passing close to the nesting tree flushed the old bird from the nest. This eagle did not make much of a disturbance, owing to her eggs being newly laid, and after making a few wide circles and getting into an argument with some Fish Crows, she left and was not seen again. This tree was a large one, forty-two inches in diameter and an even ninety feet to the nest, which was reached without any difficulty. Two eggs were collected and lowered to the ground. The nest proved to be new, and had been built only this year, as the old nest had fallen just a short time ago. The exterior width was four and one-half feet, and the exterior depth was four feet. The interior measurements were sixteen by twelve inches. We next went over to take a look at the old nest, or what used to be a nest, and found that the old birds had repaired it this season, apparently with the expectation of raising another family there. Quantities of fish bones and feathers were found throughout the whole nest, and the amount of material which comprised the nest was fifty-one cubic feet. This ended the morning and we drove back to town for dinner.

In the afternoon we visited a nest on Green Spring farm, the former home of Governor Bacon of colonial days, but it developed that a bootlegger had killed one of the eagles two weeks previously and the other bird had deserted the nest. This nest was two years old and built near the top of a large pine leaning over a marsh along the James River, and from the way the bark was scratched many raccoons had been using it for a sun parlor at times. The top of the nest was flat and measured six feet wide by three and one-half feet deep. Previous to building here the eagles had occupied a pine tree a short distance away, and owing to the limbs not being properly spaced for continuous building from year to year, the eagles had a three-story affair. Two years ago lightning struck the tree and killed it, after which the eagles deserted it and took the nest of a Red-tailed Hawk as the foundation of their new nest.

Nest No. 4 was on Pine Dell, in a dense swamp making back from the river, and not having been to the nest for two years I became confused in my bearings, and after walking around for about an hour I had to make a fresh start from where I first went into the swamp. This time I did better, and on arriving at

the tree found that the old eagle was at home. This nest also was in a large green pine, ninety-seven feet up from the ground, and was three years old. This nest contained two eggs which were considerably larger than those collected in the morning. They measured 3.03x2.35 and 2.88x2.37, and were incubated about ten days. The exterior of the nest was six feet in width by four feet in depth, and the interior was twelve by six inches. The bulk of the nest, as all others, was composed of sticks with enough discarded ones lying around the base of the tree to build a fair-sized nest. The lining was of shredded cedar bark and green pine twigs, while the other three were lined with marsh grass, cattail down and seaweed.

By the side of an old fish pond was an eagle's nest which I used to regard with admiration when a boy, and whenever in the neighborhood I generally pay it a visit. To pass it by this time would have made it seem that something was lacking in the day's program with the eagles. Long before we reached the nest we could see it plainly, even through the big timber, and on account of the isolated situation the birds were not wild at all. The old eagle did not leave the nest until we were at the foot of the tree. This pine tree was still living and one of the few nest trees which I never had any designs on collecting the eggs from, as it must have been ninety feet to the first limb and no trees growing very close to it. The nest was at least fifty years old, and it was one which most any eagle could be proud of, if bulk were taken into consideration. Going around to another cove of the pond I counted seventeen eagles sitting in one pine tree and quite a number of others flying around. These were all in immature plumage, some appearing almost black, others gray and some having a mottled appearance. This is not unusual, however, for I have frequently seen flocks of immature eagles, but not as many together as on this occasion. As far as I have observed the eagles do not breed until past four years old, for none but the white-headed ones were ever seen at a nest. I had other nests in view which in the beginning I had intended to visit before returning home, but as the eggs were further advanced in incubation than I wanted them, I decided that day with the eagles was sufficient for the season.—F. M. Jones, *Independence, Va.*

The Iowa Specimen of Pacific Loon Re-examined.—On November 16, 1895, an immature male Pacific Loon (*Gavia arctica pacifica*) was shot by W. H. Eldredge of Sabula. This bird was swimming in the Mississippi River in front of the town of Sabula, Jackson County, Iowa. The specimen was given to Harold J. Giddings, who mounted it, and since that time (except for a few months when it was forwarded to the Biological Survey, Washington, D. C., for examination) it has remained in Mr. Giddings' collection at his farm home, three miles northwest of Sabula.

This specimen was examined by the writer on April 15, 1933, and its identity as *Gavia a. pacifica* was satisfactorily corroborated. This loon is in winter plumage with the throat and entire underparts white, somewhat discolored due, no doubt, to the many years it has stood as an *objet d'art* in the "sitting room" of the Giddings' home. Each dark feather on the back of the bird is faintly margined with grayish, an entirely different pattern than the spotted-backed appearance of *Gavia stellata.*

Measurements of the specimen, in inches, recently taken by the writer are: wing, 11.95; tail, 2.28; tarsus, 2.70; exposed culmen, 2.02; depth of culmen at base, .54; depth of culmen at nostril, .48; culmen from nostril, 1.53. The dis-

tance from the base of the culmen to the anterior point of the loral feathers is less than from the latter point to the anterior extremity of the nostril. The culmen is slightly convex and definitely does not have the concave line at the nostril, as found in *G. stellata*. The length of the tarsus is less than the inner toe with claw.

R. M. Anderson (*Birds of Iowa*, pp. 151-152, 1907) includes the account of the capture of this bird published by Giddings in the *Iowa Ornithologist*, II, p. 73, 1896. Anderson stated that the bird was taken by Mr. W. Eldridge, while it was swimming in the Mississippi River a little way from the shore opposite Sabula, on November 15, 1895. The slightly different details of its capture as I have stated them above were contained in a letter received from Mr. Giddings on October 11, 1932, and recently verified at the time of examining the specimen.

F. Seymour Hersey has shown (*Auk*, pp. 283-290, 1917) that all records of *Gavia arctica* from the United States and Canada actually refer to *G. a. pacifica* or to some other species of loon, the range of the Siberian bird being restricted to the west coast of Alaska, with a straggling record at Victoria, British Columbia. Based upon Hersey's study, no doubt, the A. O. U. Check-List, 4th Edition, stated the wintering range of *G. a. pacifica* as, "mainly on the Pacific coast of North America from southeastern Alaska and British Columbia to southern Lower California. Accidental in Arizona, New Mexico, New Hampshire, and New York (Long Lsland)." It should now be amended to include this single Iowa occurrence.—Philip A. DuMont, *Museum of Natural History, University of Iowa, Iowa City, Iowa.*

Cardinals Re-c'aim a Deserted Nest.—On May 2, 1932, I found the nest of an Eastern Cardinal (*Richmondena cardinalis cardinalis*) containing a single egg of the Eastern Cowbird (*Molothrus ater ater*). On May 6 the nest still contained the single egg, and I decided that the Cardinals had deserted the nest. I had observed on a number of occasions that if a Cowbird deposits an egg in the nest of another bird before it is finished, or before the owners of the nest have deposited an egg, the owners will, almost without exception, desert the nest. On the other hand, if the Cowbird is patient enough to wait until the owners of the nest have deposited even one egg, before depositing her own, she may rest content that her egg or eggs will almost always be accepted and cared for.

I do not know what I had in mind on May 6, 1932. I didn't expect the Cardinals to return. But the parasitic habits of the Cowbird exasperate me at times, and I tossed the egg out of the Cardinal's nest. And the Cardinals returned! On May 7, the nest contained one of their eggs; on May 8, another, and so on until four eggs were laid. In due time three young Cardinals clamored for food, one egg having failed of the proper issue. Again the parent birds deserted the nest, now sadly showing signs of abuse, but the three youngsters accompanied them.

I wondered why the Cardinals had returned to the deserted nest. Surely they had not been idle during those days when the nest housed a Cowbird's egg. I was inclined to believe that a second attempt at nest building elsewhere had met with failure and they, in passing, had discovered that the first built nest had in some inexplicable way again become fit for Cardinal habitation, and had hastened to benefit by the discovery.—Grant Henderson, *Greensburg, Ind.*

Large Flocks of the Golden Plover and White Pelican Near Sioux City, Iowa.—On October 20 and 21, 1931, the writer had the pleasure of watching the activities of a good many Golden Plovers (*Pluvialis dominica dominica*). On the first day I counted flocks of twenty-six, forty-seven, and twenty-five birds, and estimated two other flocks at forty and two hundred birds. The plovers were feeding on fields that had been planted with winter wheat and the sprouts were about two inches high. One field of wheat which was four or five inches high was frequented by one small flock of birds, but in every other case the birds were found on the more open fields. The second visit to these bottoms, about fifteen miles below Sioux City, found most of the birds gone, and only about one hundred birds were seen.

The first fall migrant White Pelicans (*Pelecanus erythrorhynchos*) were seen on October 1, when a flock of fifteen birds were seen on the Missouri River. The afternoon of October 4 furnished an inspiring sight, when a flock, carefully estimated at from 2,000 to 2,500 pelicans, was seen over the Missouri River about twelve miles south of Sioux City. The great mass of birds circled and milled around for a long time, and gradually passed to the south. I was just ready to start for home, when I happened to look toward the river and saw another cloud of white appearing from the north. The second flock contained between 1,000 and 1,500 birds and was executing the same aerial maneuvers as the first group. These two flocks of pelicans must have constituted a considerable portion of all of the White Pelicans that still nest in the prairie provinces of Canada.—William Youngworth, *Sioux City, Iowa.*

ORNITHOLOGICAL LITERATURE

Les Oiseaux de France. By A. Menegaux. Published by Paul Lechevalier & Sons, 12 Rue de Tournon, Paris, VI. Pp. 1-290, figs. 1-107, col. pls. 1-64, 1932. Price, 50 fr.

In this pocket handbook in the French language we find just the book that many of us need to use in brushing up in our reading of French. The information will be sufficient to hold the interest and the exercise will carry its own reward. "The Birds of France" is projected as a series of three volumes, of which this one is the first. It contains an introduction to the study of ornithology and descriptive treatment of the birds of prey, the gallinaceous birds, the doves, and the woodpeckers. The second volume will contain the water birds, and the third volume will contain the passerine birds, "qui font le charme des campagnes francaises".

The first part of this volume, consisting of the Introduction and covering the first 197 pages, includes brief discussions of zoological nomenclature, zoogeographical regions, structure of the bird, banding and migration, methods of collecting and caring for skins and eggs, insect pests of collections, and insect parasites of living birds. The second part of the volume, called the Atlas, is illustrated with sixty-four colored plates, one species to each plate. We judge that these portraits are produced by coloring the photographs of mounted birds. There is also an accompanying description of each species.—T. C. S.

A Distributional List of the Birds of Tennessee. By Albert F. Ganier. Tenn. Avifauna No. 1. Pub. by Tenn. Ornith. Soc. Nashville, 1933. Pp. 1-64. Price, 50 cents.

The author has produced a very serviceable bird list for his state. The total number of birds included in the list is 302, nine of which are, however, extinct, introduced, or accidental. The State of Tennessee is naturally divided into three regions, known as East, Middle, and West Tennessee, presumably ecological regions; the status of each species is given for these three regions. In order to contain all the data to be presented the format has been very much modifid from that of the usual list—almost approaching tabular form; but it is a very systematic arrangement of facts, and should facilitate the finding of information. The preparation of so complete a catalogue of information represents a great amount of work, and requires a detailed knowledge of an area which is possessed by few amateur ornithologists. Such a carefully prepared list establishes a new basis upon which to begin research.—T. C. S.

Game Management. By Aldo Leopold. Published by Charles Scribner's Sons, 597 Fifth Ave., New York. 1933. Pp. i-xxi+1-481, figs. 1-35, tables 1-53. Price, $5.00.

This is a new book in a relatively new field. The author draws a distinction between conservation and management in the following way: "The conservation movement has sought to restore wild life by the control of guns alone, with little visible success. Management seeks the same end, but by more versatile means. We seem to have two choices: try it, or hunt rabbits." We did not know that the two terms were in contra-distinction. We had looked upon management as a new factor, or method, in the conservation program—a means, not an end. However we may regard this matter, the management of game and wild life seems to be a progressive step. It is a positive, or constructive, program. Even with this new and constructive practice we will hardly be able to discard the regulatory effects of law, though we need not depend wholly upon the latter.

Just what is game management? This is what the book attempts to answer. The author calls game management the "art of making land produce sustained annual crops of wild game for recreational use". The reviewer, who has done at least desultory reading during the past twenty years on many of the problems of wild life, is nevertheless surprised at the mass of organized material, fact, and theory, brought together in this first comprehensive survey of the subject. Population density, cycles, radius of mobility, environmental and race tolerances, sex ratios, flock organizations—these are just a few of the topics in the theoretical discussion. Under the general heading "Management Technique" we find chapters on such matters as, measurement of game populations and census, life equations, game refuges, control of hunting, predator control, control of food and water, control of cover, control of disease, accidents, etc.

This is all very interesting and readable, even to the ornithologist. It is a scientific analysis and presentation of facts. The one thing that is not entirely clear to us is, what is the ultimate aim and goal of game management? In so far as it is simply restoration of native game many would find little fault, even though it is understood that excess populations will be used for hunting purposes. To what extent importation, introduction of exotic species, meddling with natural ranges, artificial breeding, etc., go along with the concept of

game management remains yet to be seen. These are probably the controversial topics, which possibly may dissipate as knowledge and understanding of facts and viewpoints develop. Every lover of nature is a conservationist at heart. He is an optimist, a philanthropist, an altruist, and hence he desires that some of this old world may be handed on to posterity as God made it, not altogether as man has improved it. And it is most reassuring to observe that such sentiments are now being held by an increasing proportion of game hunters. Apparently this book is written for, and undoubtedly reflects, the highest type of American sportsmanship. And it can not be other than fascinating reading for the bird lover.—T. C. S.

Water Birds of Reelfoot Lake. By Albert F. Ganier. Tenn. Avifauna No. 2. Revised and reprinted from Jr. Tenn. Acad. Sci., VIII, No. 1, Jan., 1933, pp. 65-83.

Fifty-nine forms of water birds are listed and annotated; a few species of land birds are mentioned in the introduction.—T. C. S.

Postjuvenal Molt and the Appearance of Sexual Characters of Plumage in Phainopepla Nitens. By Alden H. Miller. Univ. Calif. Pub. Zool., Vol. 38, No. 13, pp. 425-446, 1933.

It is interesting to note that the observations of Dr. Miller on the relation between gonadal development and feather pattern in the wild form, Phainopepla, tend to confirm the findings of Dr. Lillie and his colleagues on domesticated species. There is also the bare suggestion that variation in gonadal development, and hence in feather pattern, may be correlated with geographical distribution and climatic factors.—T. C. S.

A Statistical Study of Ohio Bird Life. By Lawrence E. Hicks and Floyd B. Chapman. Ohio Jr. Sci., XXXIII, No. 2, March, 1933, pp. 135-150, 2 figs., 2 tables.

A very interesting and useful study of accumulated data on winter bird life in Ohio.—T. C. S.

Abundance and Conservation of the Bob-white in Ohio. By S. Charles Kendeigh. Ohio Jr. Sci., XXXIII, Jan., 1933, p. 18.

The figures presented show that the population of Bob-white in Ohio has roughly trebled since the species was placed on a non-game basis in 1913; for a period of years it had more than quadrupled. The author repudiates the old argument that hunting improves the stock by scattering the covey and preventing inbreeding. The paper takes up a number of other very practical problems for consideration in the light of recent scientific theory. The conclusion is that it would be inadvisable to have a general open hunting season in Ohio; at most hunting should be confined to local areas where the species is sufficiently abundant, but the author does not say that he favors this.—T. C. S.

Birds of the Region of Point Barrow, Alaska. By Alfred M. Bailey, Charles D. Brower, and Louis B. Bishop. Program of Activities Chicago Acad. Sci., IV, No. 2, April, 1933, pp. 15-40. Price, 25 cents.

This paper gives a history of the ornithological work in the region of Point Barrow, covering an area of approximately one hundred and fifty miles inland. The list includes material collected by the authors, and summarizes the records in the literature. The list is, therefore, probably a comprehensive one. A bibliography is appended.—T. C. S.

METHODS OF COLLECTING AND PRESERVING VERTEBRATE ANIMALS. By R. M. Anderson. Bull. No. 69, Nat. Mus. Canada. 1932. Pp. i-v+1-141, figs. 1-46. Price, 25 cents in paper, 50 cents in cloth, and obtainable from the Director, National Museum of Canada, Ottawa.

This handbook is dated 1932, though distributed early in 1933. In it Dr. Anderson has prepared a vade mecum which will be most useful to all field collectors of vertebrates. The introductory chapter treats of the general principles of zoological collecting; other chapters deal with collecting mammals, skinning mammals, collecting and skinning birds, collecting cold-blooded vertebrates, and preparing skeletons. The mammals have received the greatest attention, but the chapter on making a bird skin is, we judge, quite complete. Directions are not given for mounting the specimens. The instructions for cleaning bones will be as useful to teachers as they are to museum workers. This is, by all means, the most practical and useful aid to the preparator which we have seen.—T. C. S.

FAUNA OF THE NATIONAL PARKS OF THE UNITED STATES. By George M. Wright, Joseph S. Dixon, and Ben H. Thompson. Fauna Series No. 1, Wild Life Survey, National Park Service, Washington, D. C., 1932, pp. 1-157, figs. 1-56. (Distributed, April, 1933). Price, 20 cents.

This report is the result of work by the Preliminary Wild Life Survey of the National Parks, with headquarters at Berkeley, California. We understand that this survey originated as a private enterprise, supported by private funds, but that in 1931 public appropriations were obtained which helped to finance the work and give it official status. The purposes of the Survey are stated to be 1) the establishment of a rational wild life policy for the National Parks; 2) to assist in the solution of wild life problems of immediate urgency; 3) to study the existing status of wild life in the Parks.

The present paper deals chiefly with the third of these objectives, and takes account only of the vertebrate life, chiefly the mammals; birds are very lightly touched. Perhaps we might say that the report deals mainly with the analysis of the problems and procedure. One very interesting point brought out is that the horses used for the pleasure of tourists are pastured in the Parks. These horses use food which should be left for the wild game. Since in many cases the public buys hay for the game during the winter the matter becomes also one of economy. The report also calls attention to the fact that removal of dead trees from the roadsides eliminates many nesting sites of certain birds, and reduces the chances of visitors seeing such species. Whether in practice these trees are removed except in the interest of safety is not shown.

In certain of the Parks oil has, apparently, been spread upon the lake waters for the benefit of human inhabitants, and to the harm of wild life, especially birds. These are examples of the many wild life problems arising in the administration of the Parks, and which this report aims to gather up for analysis and solution.

Numerous references to the literature are given in the foot-notes; nevertheless we believe the usefulness of the report would have been considerably increased by a bibliography of literature relating to the wild life of the Parks.—T. C. S.

Temperature and Relative Humidity in Relation to the Ending of the Evening Song of Birds. By Paul R. Elliott. Journ. Tenn. Acad. Sci., VII, No. 3, 1932, pp. 204-213.

This rather technical paper is especially instructive in showing the method of studying the problem indicated in the title. Ten of the more common birds were studied. The Mockingbird seemed to show a temperature correlation, but in the other cases it did not seem to be evident. The analysis of the external physical factors regulating song seems to be still a very wide and open field for study, and deserves more attention from field workers.—T. C. S.

1. Blood Money for the Audubon Association. By Mrs. Edward Breck. Published by the Anti-Steel-Trap League, Inc., 1731 K St., N. W., Washington, D. C.
2. Conservation To-Day. By Rosalie Edge. Emergency Conservation Committee.
3. Hands Off Yellowstone Lake. Emergency Conservation Committee.
4. Blacker than the Crow. Emergency Conservation Committee, 113 East 72d St., New York, N. Y.

These are all militant leaflets in behalf of wild life, and should be read by everybody whether they agree or disagree. It would not seem that there is any chance to impute selfish motives to this propaganda.—T. C. S.

Scientific Studies of Natural Flight. By Maurice Boel. Aeronautical Engineering, Vol. I, No. 4, Oct.-Dec., 1929, pp. 217-242.

The author discusses flight under four headings, viz., gliding, soaring, flapping, and propulsive flight. He defines gliding flight as the descent of a body at constant speed following a trajectory somewhat inclined to the horizontal. Soaring flight is a passive form which depends upon vertical air currents for motive power. Flapping flight "appears to be the most ingenious and perhaps the most efficient process of aerial locomotion known . . . it can be represented as a succession of short descents in gliding flight". Propulsive flight, the author says, is a special type of flight utilizing the primary wing feathers for horizontal translational motion. "To this class of fliers belong certain birds of prey such as the condor, the vulture, and the eagle". In experiments with a vulture the removal of the forward barbs of the primaries resulted in inability to fly.—L. W. Wing.

1. The Protection of Hawks and Owls in Ohio. By S. Prentiss Baldwin, S. Charles Kendeigh, and Roscoe W. Franks. Ohio Journ. Sci., XXXII, No. 5, Sept., 1932, pp. 403-424.
2. The Birds of Prey. By George E. Hix. Pp. 1-32. 1933. Privately published. Price, 25 cents. Order from the author, 337 72d St., New York, N. Y.
3. Food Habits of Southern Wisconsin Raptores. Part II, Hawks. By Paul L. Errington. Condor, XXXV, Jan.-Feb., 1933, pp. 19-29.
4. Hawks and Owls of Ontario. By L. L. Snyder. Toronto, 1932. (Previously cited in these pages, *antea* page 126).

The numerous papers on the economic aspect of hawks and owls, which have appeared recently, indicate a considerable interest in the subject; and it is possible that officials and the public may yet be stimulated into a correct attitude towards the birds of prey. The paper by Dr. Baldwin and colleagues (No. 1 above) contains important data on the numbers of hawks and owls in Ohio at

present. It also presents a helpful summary of the arguments against the continued devastation of these birds. A valuable bibliography is included.

The paper by Mr. Hix (No. 2 above) is written especially for the instruction of Boy Scouts. The species treated are those which "are more or less generally distributed over North America", and hence the pamphlet will be useful as a Scout guide on hawks and owls in most parts of the country, giving, as it does, descriptions of structure and habits.

The paper by Dr. Errington (No. 3 above) presents numerous original facts upon the food habits of certain hawks. The studies are especially full on the Marsh Hawk, the Red-tailed Hawk, and two or three of the injurious species, as the Goshawk, the Cooper's Hawk, and the Duck Hawk.

Mr. Snyder's pamphlet (No. 4 above) is also a good general guide in identification and on the habits of these birds. All of them are probably still available. No. 1 may probably still be obtained as a reprint from Dr. S. P. Baldwin, Gates Mills, Ohio. No. 2 is obtainable as mentioned above. No. 3 may not have been issued separately. No. 4 may be secured from the Royal Ontario Museum of Zoology, Toronto, Canada, for 35 cents. Reprints of Mr. Gloyd's paper on the diurnal raptores (published in the WILSON BULLETIN for September, 1925) may be obtained from the Editor for eight cents in stamps.—T. C. S.

UNINTELLIGENT NEST BUILDING. By Paul Amos Moody. Vermont Botanical and Bird Club—Joint Bulletin, No. 15, May, 1932, pp. 18-22.

Dr. Moody discusses an interesting case of interruption of the mechanism of chain reflexes in nest building. Wind blew away the nest materials as fast as the bird brought them, but she kept on until many times the necessary amount of material had been wasted; and finally she laid three eggs on the bare surface where the nest should have been—and the eggs were blown off too. At this stage efforts at this location ceased. What is the psychological explanation? The study of bird behavior is in its infancy, but it offers a fascinating and promising field.—T. C. S.

BIRDS OF KEWEENAW POINT, MICHIGAN. By Norman A. Wood. Reprinted from Papers of the Mich. Acad. Sci. Arts, Letters, Vol. XVII, 1932, pp. 713-733.

The area considered in this paper is the largest promontory of Michigan projecting into Lake Superior, and is noted as a copper mine region. The observations were made in the spring of 1931. The list includes 121 forms. The author refers to Kneeland's observations in the same region in 1856-57 and his list of 147 species (Proc. Boston Soc. Nat. Hist., VI, pp. 231-241). The long period of time between the two studies should offer an opportunity for an interesting comparison, especially if significant changes could be found. Considerable attention has been given to Isle Royal, and it is rather surprising to find that no more attention has been given to the area treated in this paper.—T. C. S.

The Annual Bulletin for 1933 of the Illinois Audubon Society was distributed during the spring. Mr. Tappan Gregory presents a narrative of some field work in northern Michigan, showing two very unusual flashlight photographs, one of a Bald Eagle and one of a Ruffed Grouse. Dr. Lewy and E. R. Ford recount their field experiences in northern Minnesota. A. M. Bailey presents some excellent photographs of a female American Eider Duck on her nest. Clayton H. Tanner describes the flocking behavior of the Purple Martin, and

mentions their habit of daytime roosting on the roofs of buildings. Many other interesting items are included. The Annual is published by the Society, with headquarters at the Chicago Academy of Sciences, Lincoln Park, Chicago.

Since our last survey of the ornithological literature which has reached us, a new printed serial has appeared, the *Nebraska Bird Review*. It is the official organ of the Nebraska Ornithologists' Union, is published quarterly, and the two numbers thus far received have had 24 and 32 pages respectively. Prof. M. H. Swenk is the Editor. Since he is also the Secretary-Treasurer of the Union, all subscriptions should be addressed to him at 1410 N. 37th St., Lincoln. The rate is $1 per year in the United States, and $1.25 elsewhere. The January number contains a census of the birds along a five-mile strip of highway in central Nebraska, thirty years ago, by the late J. M. Bates. Eleven pages of interesting general notes make up the bulk of this issue. The April number is equally readable, and the Society and its Editor are entitled to praise for the quality of material and the neatness of format. This organization has now passed its thirty-first annual meeting.

The *Raven* has appeared at regular monthly intervals since our last account. The February, 1933, number contains the minutes of the fourth annual meeting. The March number is taken up entirely with "A brief history of Virginia Ornithology", by James J. Murray. This paper seems to be an excellent example of the type of a preliminary survey of ornithological literature which many states now need. It probably should not be qualified as "preliminary", since it is a complete survey in every respect.

The *St. Louis Bird Club Bulletin* is being issued monthly in mimeographed form. The March, 1933, number gives special attention to the European Tree Sparrow, which was imported and established in the St. Louis region in 1870. The status of this species in our country is a matter of interest to all ornithologists. A feature of each number is the "Widmann Column", presenting a timely communication from Mr. Otto Widmann.

The *Chickadee* is the organ of the Forbush Bird Club at Worcester, Mass. The frequency of issue and the number of pages (mimeographed) of material indicate the activity of this eastern bird club. In an article on plumage changes in the most recent number, Mr. Thomas F. Power, Jr. has some interesting remarks on the variation in iris color in individual birds, and the apparent seasonal change in such pigment. Mrs. K. B. Wetherbee observes that the Bluebird family remains grouped until at least late fall. Mrs. W. Gray Harris gives important facts on the feeding habits of the Catbird as a winter sojourner in the north.

The *Flicker* begins its Volume Five with the issue of February, 1933. We find in it a very interesting article by Stanley Stein about the numerous and unusual difficulties he has had in operating his traps for banding birds.

News from the Bird Banders (published quarterly by the Western Bird-Banding Association) for November, 1932, contains a splendid review of the literature on territory in bird life, together with a useful, though incomplete, bibliography. It is unfortunate that so excellent a summary should be presented anonymously. The January, 1933, issue contains instructive discussion of the use of colored celluloid bands for identifying birds out of hand, and also a

splendid anonymous review of Schüz and Weigold's Atlas of Bird Migration. In the April issue there is more discussion of colored bands, and a summary of the banding work for 1932 in the fourteen western states and provinces of the Association. The question is raised concerning the availability and utility of the increasing mass of data in the archives of the Biological Survey at Washington. The whole work becomes useless if the data are merely to be stored.

Inland Bird Banding News (published quarterly by the Inland Bird Banding Association) for December, 1932, contains a report of the last annual meeting, at Chicago. Mr. M. J. Magee writes on the cat problem. He does not believe that the cat license idea will work as expected, and thinks that in no case should cats be protected off their owner's premises. The March, 1933, issue contains papers on banding activities by Professors Louis A. and Frederick H. Test, in Indiana; by Harold C. Wilson, in Wisconsin; by F. E. Ludwig, in Michigan, and by F. W. Robl, Kansas.

The Bulletin to the Schools, of the University of the State of New York, for March 15, 1933, is a Bird Day number. It contains articles by E. H. Eaton, on "Our birds of prey"; by Dayton Stoner, on "Superstitions and facts about Kingfishers"; by Chas. J. Spiker, on "Some fall and winter birds of a farm dooryard"; by Dr. George S. Britten, on "Nesting warblers of central New York"; by C. Huber Watson, on "Early nesting of the Great Horned Owl"; and three papers on bird banding, by Allan C. Fraser, Daniel Smiley, Jr., and Goeffrey Gill.

Bulletin No. 12 of the International Cat Society was distributed in April. All of these bulletins carry information of interest to bird lovers. It occurs to us that this organization should be called a cat abatement society, to indicate which side of the cat question it is on. This Bulletin No. 12 gives information concerning the rats on Rikers Island, a refuse dump for New York city. It is estimated that there are a million rats on the island (not at all hard to believe). When cats were placed there to destroy the rats, the rats chased the cats, so they say. Dogs had no better success.

We have previously given the business addresses of the periodicals here noticed, and will do so again from time to time. The Editor will always be glad to give any address to those who may have missed the earlier notices. The number of local publications in ornithology is on the increase. Only a few are, at present, printed. Some are quarterly, others are monthly. Those which are mimeographed are all printed on letter-size paper, and some are printed in single column, while others are in double column. Some have covers, others do not. They exhibit much variation in quality of paper and legibility of printing.

There has been some discussion lately as to whether a mimeographed journal provides true publication. So long as the facts are authentic it is difficult to see how future workers can ignore mimeograph publication. Restricted distribution will, of course, be a handicap; but the information will be there recorded, for those who can find it. Some authors may hesitate about citing mimeographed publications in bibliography, but we are inclined to think that this will have to be done for complete accuracy. For these reasons we believe that those who are responsible for these publications should use the utmost care to make the printing clear and legible, and also to see that a file of their serial is preserved permanently in a selected list of libraries.

Our Library

The Wilson Ornithological Research Library at Ann Arbor is now an establishment, but with empty shelves. The arrangement with the Museum of Zoology of the University of Michigan is printed in full in the last (March) issue of the WILSON BULLETIN. This Library now solicits contributions from the members and friends. Publications on ornithology, and the allied subejcts of ecology, anatomy, exploration, travel, etc., are desired. And the following types of publications are suggested as especially desirable:

Single volumes, bound or unbound

Magazines, sets, volumes, and numbers, foreign or domestic

Authors' reprints

Maps

Reports and journals of explorations

Biographies

Bibliographies, printed and manuscript

State natural history and geological surveys

Proceedings or transactions of state scientific societies

Manuscript notebooks

Original paintings or drawings of birds

Photographs of birds, nests, eggs, habitats, etc.

Portraits of ornithologists

All portraits and photographs should be accompanied with full identifying data. Authors are requested to deposit a set of reprints of their publications. Members who wish to bequeath their libraries are invited to correspond with the officers of the Club. All gifts should be addressed to

THE W. O. C. ORNITHOLOGICAL LIBRARY,
Museum of Zoology,
ANN ARBOR, MICHIGAN

Hotel Accommodations for World's Fair Visitors

For the benefit of our readers we list the following hotels on the South Side of Chicago:

Blackstone Apartments, 6247 Blackstone Avenue. One block from the Illinois Central Electric, eight minutes from Fair Grounds. One-and-a-half room kitchenette apartments with accommodations for four people. All apartments with private bath and daily maid service. Weekly rates, $10 to $15.

Kimberly Hotel, 1430 East 67th Street. One-half block from Illinois Central Electric, ten minutes from Fair Grounds. Rooms with bath and with or without kitchenette. Weekly rates, two people, $10 to $13.50.

Euclid Hotel, 6733 Stony Island Avenue. Two blocks from Illinois Central Electric, ten minutes from World's Fair. Rooms with bath. Weekly rates, two people, $7 to $8.50; four people, $10 to $12; kitchenette, $9.50 to $12.

New Park Hotel, 1547 East 67th Place. Two blocks from Illinois Central Electric, ten minutes from World's Fair. Rooms with bath. Two people, $8 to $13; four people, $11 to $14; kitchenette, $9 to $14.

These hotels have been selected and recommended to us by the General Biological Supply House, 761-763 East 69th Place, Chicago. They (hotels) are selected for their convenience to transportation to the Fair Grounds and economy. They are neither new nor large establishments, but they provide comfortable, clean quarters at rates as reasonable as it is possible to obtain. Make your reservations directly with the hotels. The General Biological has offered to furnish information concerning the World's Fair to biologists who inquire.

The Church Housing Commission has also established an office intended to place World's Fair visitors in touch with rooms at private homes. The church public will be offered private rooms at $1 to $2 single; $1.50 to $2.50 double; and special weekly rates. Eight large church denominations are concerned in this plan. Correspond with Bert E. Smith, 211 South Wabash Ave., Chicago, for arrangements, stating church affiliation.

This is not an advertisement.